

Machine and Tool **BLUE BOOK**

SERVING THE METAL WORKING INDUSTRY SINCE 1906

MARCH 1950

Featured This Month

How Materials Handling Problems
Were Solved

Reduce Your Machining Costs 10%

Automatic Screw Machines

For Many Other Items of Interest,

*See Complete Index
on Page 5*

A HITCHCOCK PUBLICATION

"MARVEL"...

*Has
Always
Had
The
EDGE*



MARVEL High-Speed-Edge Blades assure Faster, more Accurate cutting with proven Economy and complete Safety. Only the MARVEL is a composite blade with a high speed steel cutting edge electrically welded to an exceptionally tough, strong steel body.

The High-Speed-Edge does the cutting while the alloy hack with hardened eyes, carries the load. Blade tensions up to 300% higher than those possible with ordinary blades are recommended. This greater tension is confined to the cutting or leading edge by the location of pin hole (exclusive MARVEL design feature) and cannot be overcome by work resistance. Heavier feeds and greater speeds are practical without "run out."

With greater accuracy, higher production and lower cost per cut, come the extra dividend of Safety, for MARVEL High-Speed-Edge Hack Saw Blades are Positively Unbreakable — they will not shatter.

Ask your local MARVEL distributor (see classified phone book) to help you modernize your metal sawing with Marvel High-Speed-Edge Blades. They cost no more than ordinary high speed steel blades.

High-Speed-Steel cutting edge.

Tough unbreakable alloy steel body with hardened eyes.

Integrally welded to make a fast-cutting, long lasting composite blade that is positively unbreakable.

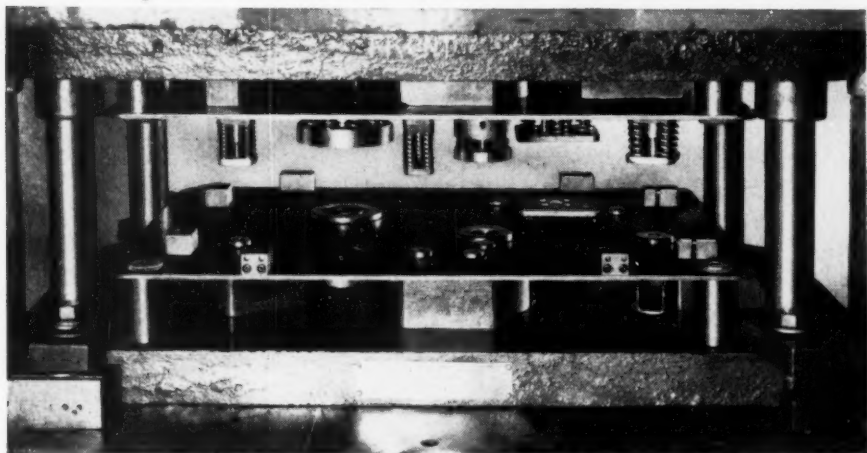
ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

MARVEL *Metal Cutting* SAWS

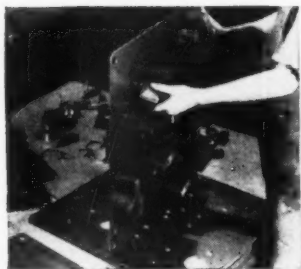
5700 Bloomingdale Ave.
Chicago 39, Illinois

Magnetic PERFORATING DIES



Magnetic Perforating Die set-up in small inclinable punch press.

NEW and FAST METHOD for Perforating Sheet Metal



Die retainers complete with bushings being inserted in die template.

Write for Catalog . . .

Whistler Magnetic Perforating Punches and Dies have proven their cost-cutting advantages in many prominent plants. The catalog shows how. Send for it today.

**First public showing of Whistler Magnetic Dies at work — Booth 832 —
ASTE Convention — April 10 to 14 — Philadelphia**

SAVE PRESS DOWN TIME. Approximately 15 minutes required to change from punching one subject of say 20 holes to a different 20 hole arrangement. Whistler Magnetic Perforating Dies *increase* press production.

HOLD CLOSE TOLERANCES. Hole centers may be held to .0005" accuracy or as close as can be jig bored.

GREATER PUNCH AND DIE LIFE. Concentricity of punch and die assured thus giving uniform clearance around punch, increasing punch and die life.

SAVE FLOOR SPACE. Die storage cut to a minimum because only the 2 locating templets are stored...all that is required to duplicate the set-up.

REDUCE DIE COSTS. Whistler Magnetic Perforating Punch and Die units are used repeatedly for different hole arrangements. When completing one job, remove all units from templet and put them into service on the next different set-up. Combine any number of hole sizes and shapes. Punch and die costs are amortized over continued re-use in many jobs.

S. B. WHISTLER & SONS, Inc. 760 Military Road, Buffalo 17, N.Y.

Also manufacturers of a complete line of drawing, forming, blanking and progressive dies to special requirements.

WHO SAYS you "CAN'T AFFORD" this modern WADE Lathe?

Actually, it's a lathe you **can't afford to be without!** A glance at the list below will show you that the Wade No. 8A has several features you would never expect to find on a lathe of this size — enabling you to perform certain operations usually requiring larger equipment.

The No. 8A is an extremely versatile lathe, carefully designed and ruggedly built for many years of precision work. So, if you're interested in *cutting costs* and *increasing production* you need this modern tool.

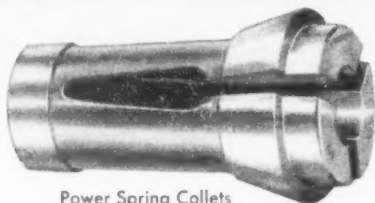
Send for the "8A Bulletin" and learn how these new features will give you the **UPPER HAND** on **PRODUCTION!**



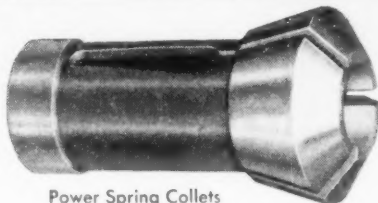
VARIABLE SPEED DRIVE
ELECTRIC TACHOMETER
FOOL-PROOF CLUTCH
AMPLE TORQUE
REAR STATION TOOL BLOCK
AMPLE FRONT GUIDEWAY
THREAD-LOCK SPINDLE NOSE
FULL-BEARING TAILSTOCK
COMPLETE ELECTRICAL SYSTEM

Swing over Bed	8 1/2"
Distance between Centers	24"
Collet Capacity	1"
Taper Standard for Centers No. 2 Morse	
Tailstock Spindle Travel	3 3/4"
Tool Shank Section	3/8" x 3/4"

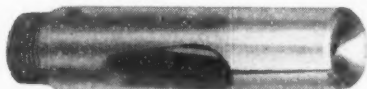
THE **Wade** TOOL CO., 51 River St., Waltham, Mass.



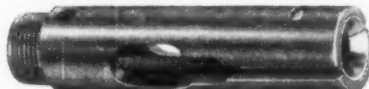
Power Spring Collets
(regular type)



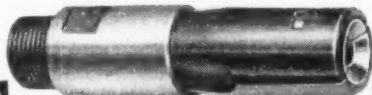
Power Spring Collets
(taper nose type)



Feed Fingers (regular type)



Master Feed Fingers and Pads



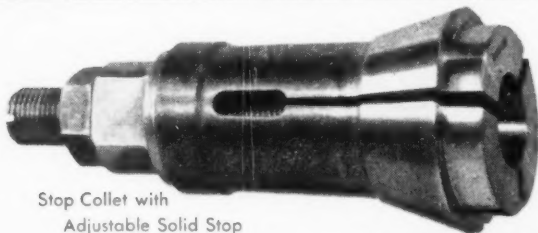
Master Feed Fingers
with Adjustable Tension

HARDINGE
ELMIRA, N.Y.

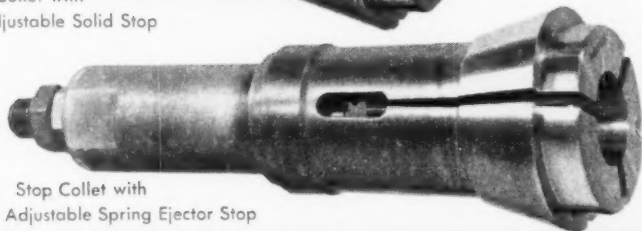
PRECISION PRODUCTS
for **BROWN & SHARPE** machines

For maximum production efficiency, specify Hardinge precision products for your Brown & Sharpe Automatics and Wire Feed Screw Machines. Reduce tooling costs and step up production with these and other Hardinge precision products engineered, customer-shop tested, and approved for Brown & Sharpe machines. Write for Catalog 36 — contains complete descriptions, specifications, and ordering information.

Deliveries from stock



Stop Collet with
Adjustable Solid Stop



Stop Collet with
Adjustable Spring Ejector Stop

HARDINGE BROTHERS, INC., ELMIRA, N. Y.
"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

SEE THE COLLET DISPLAY SPACE 701 ASTE EXPOSITION.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

ARMSTRONG

TOOL HOLDERS . . .

for the toughest steels!



WRITE FOR CATALOG

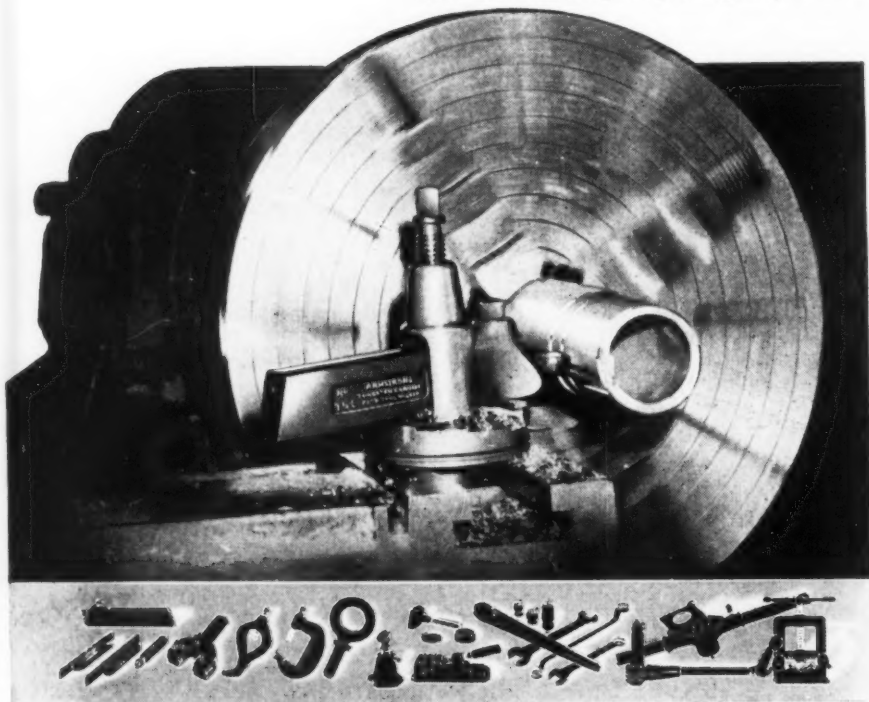
The "Armstrong System" provides special ARMSTRONG TOOL HOLDERS for ARMALLOY (cast alloy) and for ARMIDE (carbide-tipped) cutters. With these modern cutting tools, the toughest and hardest steels are easily machined. Far heavier feeds and the extremely high cutting speeds become practical (300 f.p.m. with ARMALLOY cutters; 600 f.p.m. with ARMIDE cutters). Delays for tool re-grinding are reduced to an absolute minimum — edges hold up to 100 times as long.

These new tool holders and cutters are stocked by your local ARMSTRONG industrial distributors.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5208 West Armstrong Ave., Chicago 30, U. S. A.



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Published Monthly

Vol. 46 No. 3

MARCH 1950

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New Equipment Editor

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Art Director

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District Managers

New England and Eastern N. Y. State: Dan E. Reardon, South Coventry, Conn., Telephone: Williamantic 2354-J3

New York Metropolitan Area: Alvin E. Wailles, 55 W. 42nd St., New York 18, N. Y. Telephone: Lackawanna 4-4528

Pennsylvania and South Atlantic States: Raymond J. Sietsma, 44 Revere Road, Apt. 13, Drexel Hill, Pennsylvania. Phone: Clearbrook 9-2346

Michigan and Toledo, Ohio: John A. Wright, 8630

W. Outer Dr., Detroit 19, Mich., Telephone: Kenwood 2-6140

Ohio, Western New York, Western Pa., Indiana, Kentucky: Henry J. Smith, 3529 Radcliffe Road, Cleveland 21, Ohio, Telephone: ERIview 0550

Middle West: James C. Stewart, 222 E. Willow Ave., Wheaton, Ill., Telephone: Wheaton 8-3400

Western States: Henry J. Niekerk, 1838 South Emerson St., Denver 2, Colo.

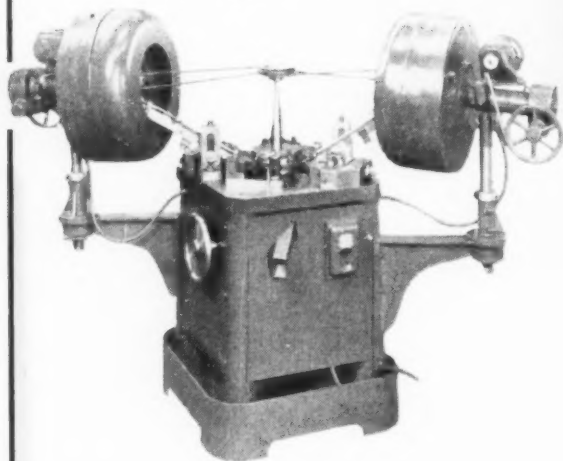
Pacific Coast: Fred Frisenfeldt, 1250 Wilshire Blvd., Los Angeles 17, Calif. Phone: Tucker 6703

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When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

The Rollmaster



**FOR ACCURATE
THREAD ROLLING**

Another PRUTTON advanced Model Automatic Machine designed for accurate thread rolling, which meets the enormous planned production schedules necessary in industry today (better than 25,000 pieces per hour).

Rotary in design, THE PRUTTON ROLL MASTER can be easily operated by unskilled workmen.

Write today for full particulars.

**TAP IT WITH A
PRUTTON**

Tapmaster

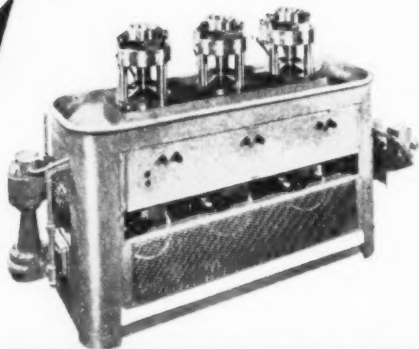
3 TAPPING MACHINES IN 1

The Tapmaster Line handles a complete range of work up to 4".

Production figures vary from 500 to 1500, depending on the type of work to be tapped.

Also available for heavy duty work is the No. 40 Tapmaster. This machine is designed for collapsible tap work up to 4".

Write today for descriptive bulletin.



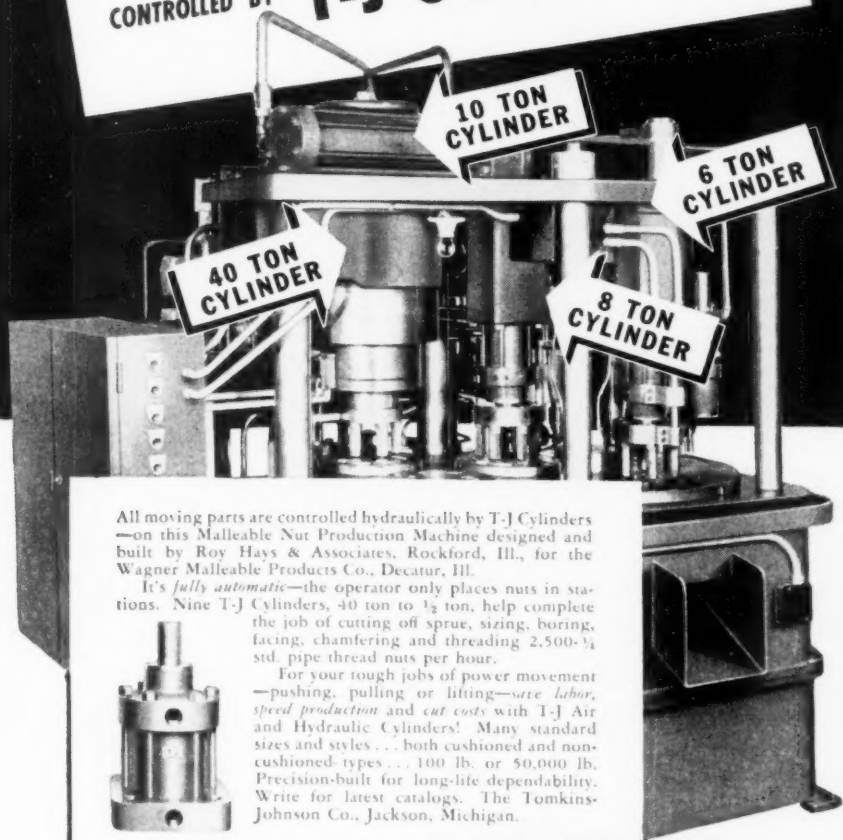
D. H. PRUTTON MACHINE & TOOL CO.
5295 W. 130th St. CLEVELAND 11, OHIO

Job File No. 194

MALLEABLE NUT PRODUCTION

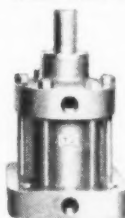
Fully Automatic

CONTROLLED BY T-J CYLINDERS



All moving parts are controlled hydraulically by T-J Cylinders —on this Malleable Nut Production Machine designed and built by Roy Hays & Associates, Rockford, Ill., for the Wagner Malleable Products Co., Decatur, Ill.

It's *fully automatic*—the operator only places nuts in stations. Nine T-J Cylinders, 40 ton to $\frac{1}{2}$ ton, help complete the job of cutting off sprue, sizing, boring, facing, chamfering and threading 2,500- $\frac{1}{4}$ std. pipe thread nuts per hour.



For your tough jobs of power movement —pushing, pulling or lifting—*save labor, speed production and cut costs* with T-J Air and Hydraulic Cylinders! Many standard sizes and styles... both cushioned and non-cushioned types... 100 lb. or 50,000 lb. Precision-built for long-life dependability. Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Michigan.

FOR POWER MOVEMENT IN ANY DIRECTION



100 LB. or 50,000 LB.

32 YEARS EXPERIENCE



TOMKINS-JOHNSON

RIVETERS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLIMBERS

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Precision Measuring

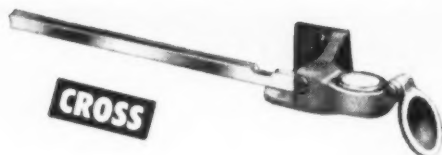


VERTICAL

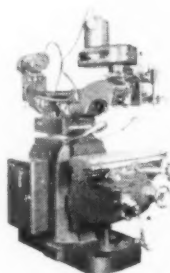
LONGITUDINAL



CROSS



"Cut-and-try" eats up time in the toolroom. Give your toolmakers better aids to precision, and they'll turn out more accurate work in less time. Precision Measuring Equipment offers a convenient and practical aid to accuracy for CINCINNATI knee-type milling machines. Tolerances of spacing within .0005" can readily be maintained in milling and boring. This equipment consists primarily of a .0001" dial indicator and a steel trough in which a "stick" micrometer and standard measuring rods can be placed. It can be obtained for longitudinal, cross and vertical movements, and produces the best results when the milled surfaces or bored holes are not too far apart, say within $\frac{1}{2}$ the length of the saddle. Write for literature. Publication No. M624-1.



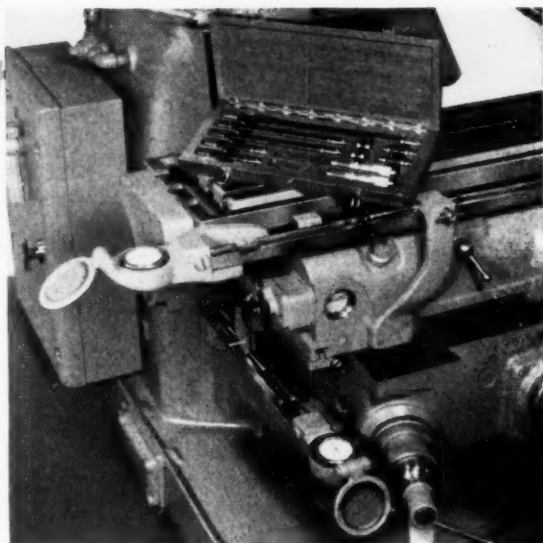
CINCINNATI 8" x 18" Tool and Die Milling Machine. Precision Measuring Equipment may be applied to this machine.

THE CINCINNATI

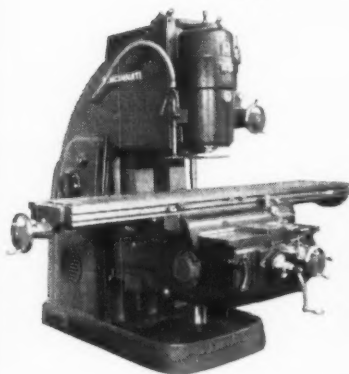
Equipment

FOR

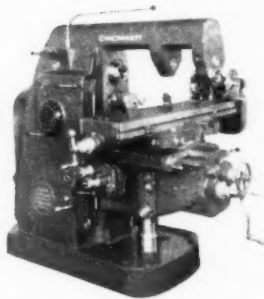
CINCINNATI MILLING MACHINES



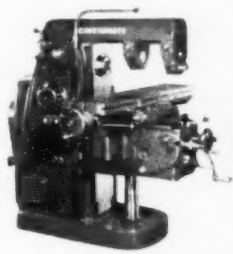
Here you have a good view of CINCINNATI Precision Measuring Equipment applied to the longitudinal and cross movements of a CINCINNATI 8" x 18" Tool and Die Miller.



CINCINNATI Vertical Dual Power Dial Type Milling Machine. Precision Measuring Equipment may be applied to all sizes and styles, Nos. 3, 4, 5 and 6.



CINCINNATI Universal Dial Type Milling Machine. Precision Measuring Equipment may be applied to all sizes and styles, Nos. 2, 3 and 4.



CINCINNATI No. 2MI Plain Milling Machine. Precision Measuring Equipment may be applied to all Nos. 2MI and 2MI Milling Machines.

MILLING MACHINE CO. CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES
FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

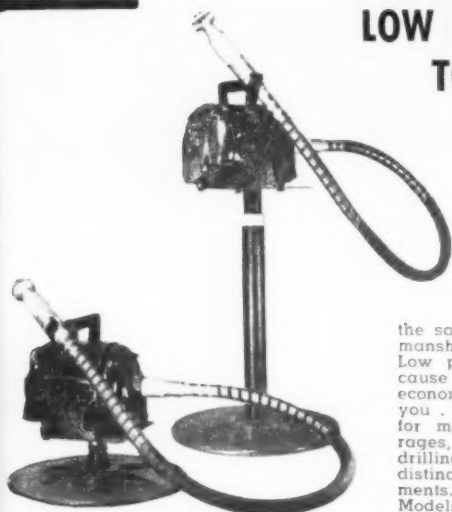
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The New

SINGLE SPEED

Econoflex

LOW PRICED UNITS BUILT TO PROFESSIONAL STANDARDS



Compare the new Econoflex with any other flexible shaft equipment on the market . . . and you'll decide on Econoflex which employs the same high quality materials and workmanship found in more expensive machines. Low prices on Econoflex are possible because of simplicity of design. Production economies thus effected are passed on to you . . . the buyer. The Econoflex is ideal for machine shops, home workshops, garages, tool rooms, etc. . . . for grinding, drilling, buffing and polishing. Made in 3 distinct mounts to meet individual requirements. Illustrated are the Bench and Floor Models. A Suspended Model is also available and is ideal where floor or bench space is lacking. Can be mounted on an Elliott pivoted bracket or on a trolley. Note the low prices below. Send today for full data, or order direct from this advertisement.

NEW LINE NOW BEING INTRODUCED

CATALOG NUMBERS				GENERAL SPECIFICATIONS				PRICE
Bench Stand	Floor Stand	Suspended Type	Motor H.P.	Shaft Speed	Flexible Shaft	Standard Handpiece	Approx. Wheel Cap	F.O.B. Binghamton
BB-131	RB-131	SB-130	1 3	3450	3 8 x 5 ft.	BH-31	4 x 1	\$ 83.50
BB-151	RB-151	SB-150	1 2	3450	7 16 x 5 ft.	BH-31	5 x 1	89.50
	RB-171	SB-170	3 4	3450	1 2 x 6 ft.	BH-31	6 x 1	101.50

Note: These low priced machines will do 75% of the grinding jobs that can be done on any flexible shaft machines regardless of price!

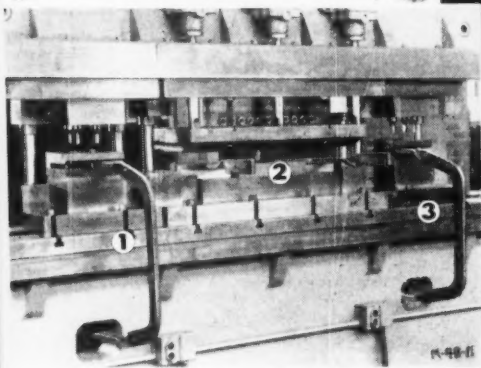
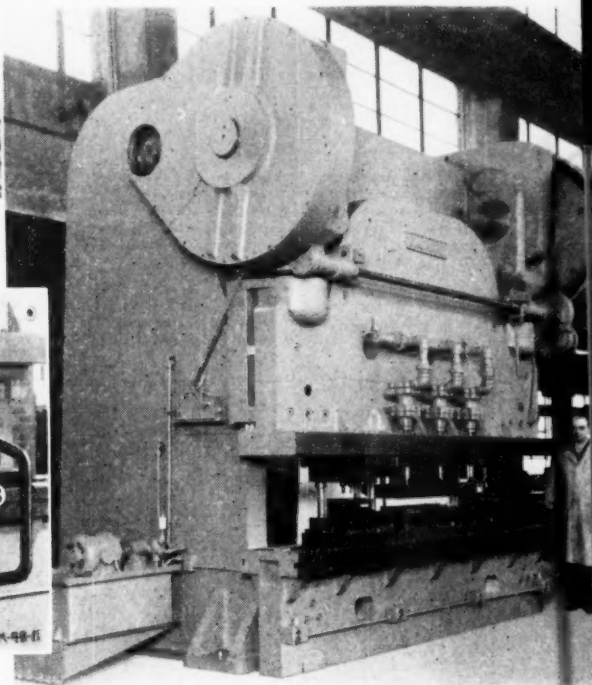
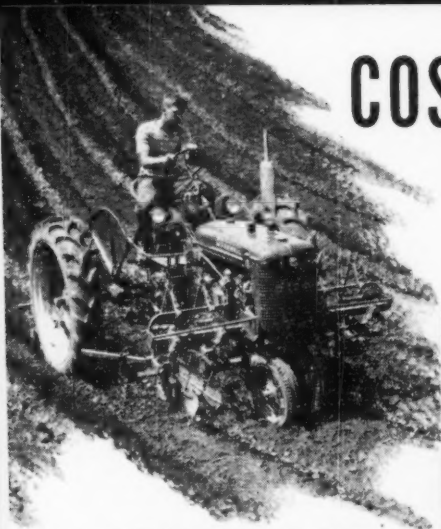


ELLIOTT MANUFACTURING CO.

202 Prospect Ave.

Binghamton, N.Y.

COSTS CUT FROM \$25.26 to \$2.24



Photographs courtesy of International Harvester Company

Simultaneously punching 3 draw bars on self-contained interchangeable die sets.

1000-Ton Cincinnati All-Steel Press Brake punching 1045 H.R. Steel tractor draw bars.

The cost of two machining operations on draw bars for International Farmall Tractors was reduced from \$25.26 per hundred to \$2.24, by changing the method to punching on a Cincinnati Press Brake.

This Cincinnati 500 series All-Steel Press Brake is punching 13 holes and 2 slots in $\frac{5}{8}$ " SAE 1045

H.R. steel draw bars. Hydraulic strippers clamp draw bars flat and strip punches effectively. High visibility of work is obtained. Two types of bars are produced and interchangeable dies are engineered for easy, quick changeover.

Investigate! Your costs may be reduced by using a versatile Cincinnati All-Steel Press Brake.

Write for the comprehensive and suggestive catalog BJA on Cincinnati Press Brakes.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.
SHAPERS • SHEARS • BRAKES

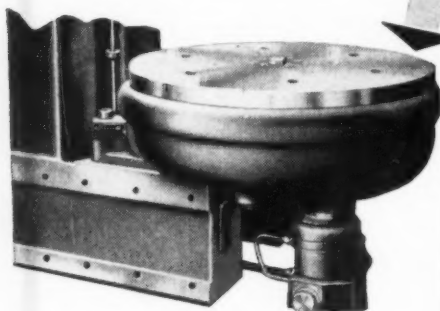


New Answer to Faster Production

Index Table Now Offers Accurate Feed For Many Types of Equipment and Many Different Operations

You get fast, automatic accuracy when you feed work to machines on Denison Indexing Tables. And now this advanced type of automatic feed is offered for use on *all types of production equipment*—backed by years of successful and often sensational results on hundreds of Denison Presses.

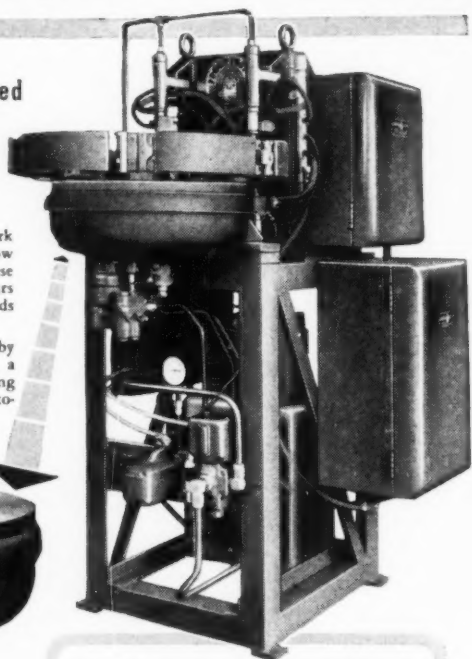
A good example is the welding unit at right, built by Progressive Welder Co., of Detroit. Equipped with a Denison Indexing Table, it features automatic feeding of parts to the welding guns, automatic squeeze, auto-



matic welding, automatic hold, and automatic release—in positive sequence and at controlled speeds. Each operation can be regulated individually.

The compactness of these streamlined, fully enclosed tables makes them easy to combine with other equipment. Tooling or fixtures can be evenly spaced about the dial for either 6 or 12-station indexing.

Speed of the table is regulative, and its movement is positively interlocked with operation of the equipment on which it is used. Space inside the table housing permits use of cam tracks, for automatic ejection. Possible variations in applications are almost unlimited. Please write for full details in terms of your own needs.



Hydraulic Pumping Unit Powers Indexing Table

Power for the Denison Index Table is supplied by this complete and highly compact pumping unit, which can be either a part of the complete machine assembly, or can be installed separately at any point, with connective piping. Available in several models and sizes.

The DENISON Engineering Co., 1184 Dublin Rd., Columbus 16, Ohio
We would like more information on Denison Indexing Tables.
We are especially interested in their possible application to:

Type of operation _____
Name _____
Firm _____
Street _____
City _____ Zone _____ State _____





"SLASH" YOUR SET-UP TIME

WITH THE

TREE

TAPER BORING TOOL"

Cut expensive set-up time from hours to a few minutes with the revolutionary TREE taper boring tool. You can use it on your present milling machine, jig borer or boring bar. Write today for complete information. In addition to boring taper holes this tool can be used for —



*Straight boring . . . as shown at left used as offset boring tool.



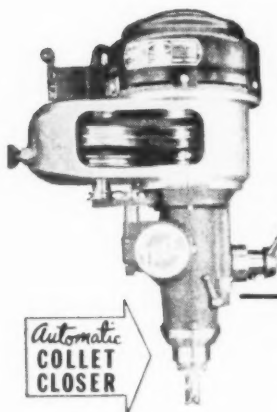
*Facing . . . up to 10" in diameter.



*Outside Turning . . . either straight or tapered up to 8" with extension bar.



Free Literature
On Request



Automatic
COLLET
CLOSER

TREE UNIVERSAL MILLING HEAD ATTACHMENT . . .

All Angle Milling, Drilling & Boring.
Compact Design, $\frac{3}{4}$ " Collet Capacity.
4" Quill Travel. Power Feed Eight
Speeds—
140-3500 RPM or 210-5200 RPM. Hardened
& Ground Spindle & Quill. Enclosed
Micrometer. Depth Stop.

For Full Information—Write Dept. B

TREE TOOL and DIE WORKS

1600 JUNCTION AVE. • RACINE, WISCONSIN

CHICAGO

Powerful

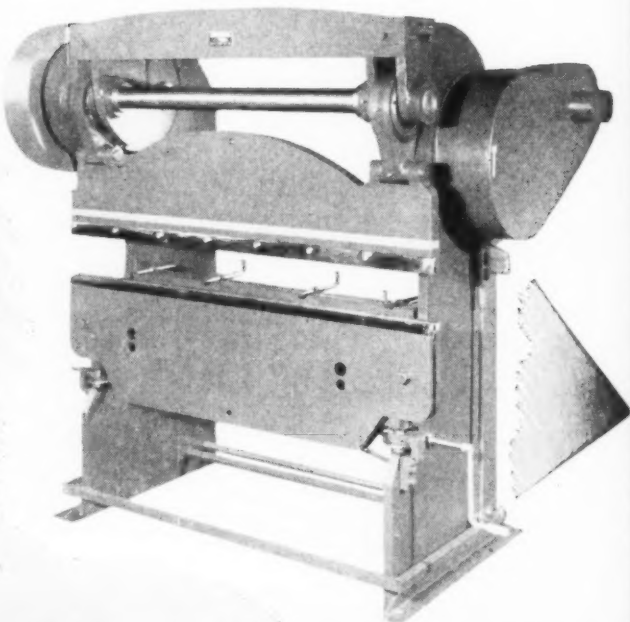
TYPE "300"

STEEL PRESS BRAKE

A Press Brake made to exacting standards and built to take hard and continuous use.

This press will do your work well and efficiently. Dependable service is guaranteed and proven by many years of operation. Variable speed drive for speed and safety.

This is only one of the many fine presses made under the banner CHICAGO. There is a CHICAGO steel press brake to meet your requirements. Your die problems are ours—let us help you.



DREIS & KRUMP MANUFACTURING CO.
7440 LOOMIS BLVD. . . CHICAGO 36, ILLINOIS



*Cut down on
Down-Time*

with **APEX** sockets & wrenches

• You can't see the inherent quality of Apex sockets and wrenches . . . the high carbon electric furnace alloy steel . . . the accurately controlled cold broaching and heat treating processes that produce tools capable of withstanding the severe strains and shocks of continuous, heavy-duty industrial service.

But you can see the benefits that Apex sockets and wrenches provide . . . less down-time and maintenance . . . increased productive output . . . and real savings in production time and tool costs. Start saving now—choose from thousands of standard stock items, or send blueprint or sketch for immediate quotation on special applications.

**APEX
SOCKET
WRENCH
CATALOG**

Lists thousands of plain and universal sockets, adapters, extensions. Write, on your company letterhead please, for your copy.

APEX

sockets and wrenches

THE APEX MACHINE & TOOL COMPANY

1028 S. Patterson Blvd. • Dayton 2, Ohio

*Safety Friction Tapping Chucks • Vertical Float Tapping Chucks • Self-Releasing and Adjustable Stud Setters
Power Bits for Phillips, Frearson, Slotted Head, Clutch Head, Hex Head and Socket Screws • Hand Drivers
for Phillips, Frearson and Clutch Head Screws • Aircraft and Industrial Universal Joints • Sockets and Universal
Joint Socket Wrenches.*

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

15



**REBUILT by
BUNELL**
at a FRACTION of
the ORIGINAL COST

LET US

Recondition YOUR MACHINES

For Accurate, Dependable Performance

Are your machines becoming worn or obsolete — unfit for today's competitive production requirements? If so, have them rebuilt by BUNELL — at a fraction of the cost of new machines.

Many manufacturers entrust their machine rebuilding problems to BUNELL, knowing that costs will be held to a minimum. Special-purpose or standard machine tools rebuilt by BUNELL are accurate and dependable. All worn bearings and parts that cannot be reconditioned are replaced. New, up-to-the-minute features, to take care of a model change-over or engineering changes in your product or parts, can be incorporated. The result is a modern, efficient machine that will perform like new on your production line.

BUNELL offers the assistance of a competent engineering department and skilled plant personnel with years of experience in building and rebuilding all kinds of machine tools, special machines, jigs and fixtures. Our complete plant facilities include the latest and finest machine tool equipment.

Take advantage of the money-saving BUNELL Rebuilding Service. We can handle machines of practically any size or weight. A telephone call or wire will receive our prompt attention. Or write for full information and complete list of our plant equipment.



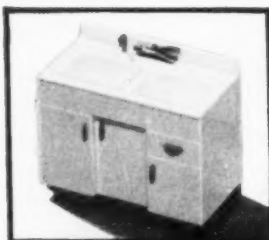
BUNELL

Since 1920, Designers and Builders of Special Tools, Dies, Jigs, Fixtures and Special Machines

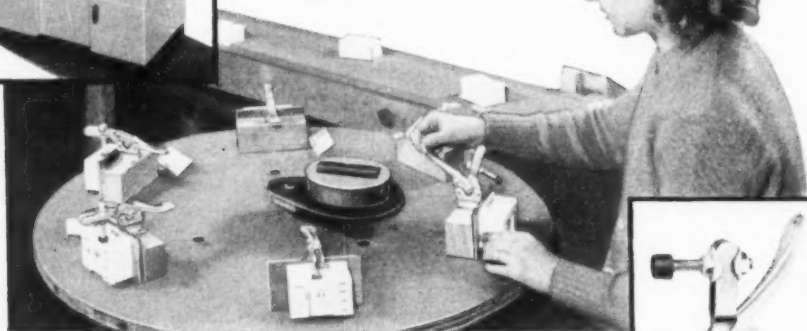
WRITE FOR CATALOG describing BUNELL machines, facilities, methods and equipment.

MACHINE AND TOOL CO.

1601 EAST 23rd STREET • CLEVELAND 14, OHIO



"Model Tooling."



Courtesy Ideal Models Co., Detroit, Mich.



for Model Kitchens!

Six versatile De-Sta-Co Toggle Clamps save in this simple, economical, plastics cementing fixture. The turntable more than doubles production . . . eliminates the cementing cycle "bottleneck."

These perfect reproductions are for a manufacturer of metal kitchens. This operation, cementing on tops, requires: Fast cementing cycle—positive clamping pressure for a perfect bond—precise alignment for accurate assembly.

De-Sta-Co No. 225-U fills these requirements. Completely retractable when opened for quick insertion and removal of work, it offers the rapid toggle action, positive holding pressure and accurate performance that make De-Sta-Co Toggle Clamps ideal "Model Tooling".

For your working-holding problems in Assembly, Welding, Bonding, Machining, Inspection . . . of any materials . . . tool up with these economical, efficient, high-production examples of "Model Tooling".

De-Sta-Co Toggle Clamp Catalog describes more than forty stationary and portable clamps. Write for your free copy today.

DETROIT STAMPING CO.

347 Midland Ave.

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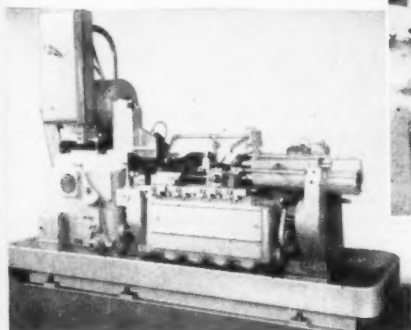
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Detroit 3, Mich.

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK

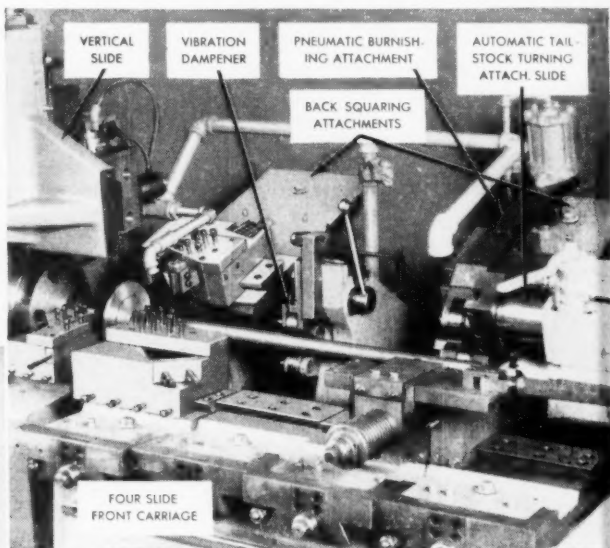
MODEL AR Lo-swing LATHE ROUGH AND FINISH TURNS AXLE SHAFTS IN ONE OPERATION AT HIGH PRODUCTION RATE



Problem: To rough and finish turn axle shafts with two cuts on flange faces and splined end, and to burnish oil seal diameter.

Solution: The Model AR Lo-swing Lathe selected for this job was equipped with a four slide front carriage, two automatic back squaring attachments, a vertical facing slide mounted on the head-stock and an automatic tail-stock turning attachment.

The shafts are delivered to the Lo-swing Lathe with ends centered and with two shallow driving pin holes drilled in the flange. After mounting the shaft between centers, a spring operated "Vibration Dampener" is set against the rough forged shaft to eliminate whip



and vibration at high cutting speeds.

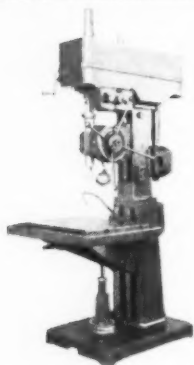
The machining cycle is divided into two distinct phases ... roughing and finishing. The front carriage and back attachment tools operate simultaneously, rough turning and rough facing the flange as well as the bearing diameters and the splined end. The roughing tools are then withdrawn from the cut and the flange is finish faced with tools mounted on the third slide, while a separate tool mounted on the tail-stock turning attachment takes a light finishing cut over the splined end of the shaft. The burnishing attachment moves into position during the latter part of the finish turning and burnishes the oil seal diameter situated near the splined end. All operations are performed automatically, the operator simply loads and unloads the part. Total floor to floor time is 1.05 minutes per shaft.

Let Seneca Falls engineers assist you with your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

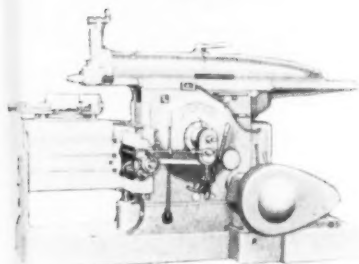
PRODUCTION COSTS ARE LOWER WITH Lo-swing

Western- THE FAMOUS LINE

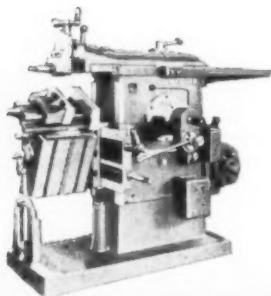


← ★ NEW

WESTERN No. 2-12 Upright Drill—Infinite spindle speeds — Sealed ball bearings throughout — 9 geared feeds — Alloy steel gearing — centralized controls — splined spindle—Back geared—1" drill capacity—Write for Catalog No. B4915.



STEPTOE SHAPERS—Vee type ram—Centralized controls — Fully Timken bearing equipped—Forced feed lubrication—Multiple disc clutch—Helical bull gear—Involute splined shafts—4 or 8 speeds—7 heavy duty sizes. America's oldest and best shaper. Write for catalog No. B4820.



← ★ NEW

STEPTOE-WESTERN SHAPERS — Vee type ram—Fully Timken Bearing equipped—Forced feed lubrication—Helical bull gear—Involute splined shafts—Alloy steel gearing—Universal Table—10" heavy Duty Vise—for medium duty at lowest cost —Available in 12" or 15" sizes. Catalog No. B4820-S.

WESTERN MACHINE TOOL

COMPLETE LINE: RADIAL DRILLS • SHAPERS • AUTOMATIC

OF PRODUCTION EQUIPMENT

THE BIG

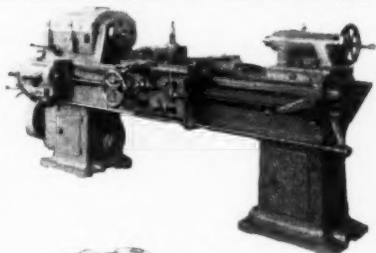
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WESTERN

LINE

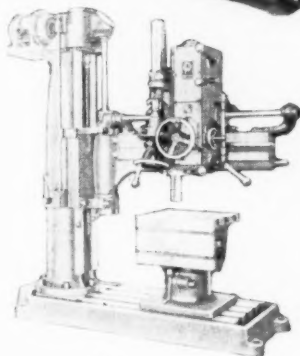
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CHARD LATHES — Timken Bearing equipped — Geared multispeed or cone head—Precision hollow spindle—Centralized controls — Full line of accessories. Available in five sizes: 16", 18", 20", 24" & 28" swing over bed. Write for catalog No. B4940.

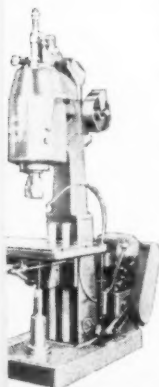


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WESTERN HIGH SPEED RADIAL DRILLS — for economical high production—"DOUBLE LOW-HUNG" spindle drive—12 speeds in head, 40—2000 R.P.M.—made in six sizes—Ball bearing throughout — Write for catalog No. B4931.

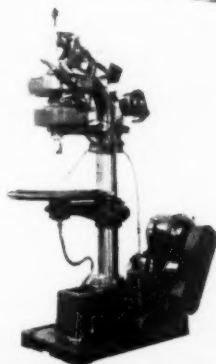


GARVIN AUTOMATIC "HI-POWER TAPPER" Timken Bearing equipped—Capacity to 4" pipe tap—4 speeds through sliding gears — Precise depth, reverse, & torque control — Involute splined spindle. "Low Hung Drive" to spindle insures accurate holes — Write for catalog B4712-H.P.



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GARVIN AUTOMATIC TAPPERS — "Operator's responsibility ends at the starting lever"—Full range of sizes and multiple heads $\frac{3}{16}$ " to $1\frac{3}{4}$ " diameter taps — Timken bearing equipped — Adjustable torque — Precision depth and reverse control—Less tap breakage—Production estimates on request. Write for catalog No. B4812-S—Specify sizes.



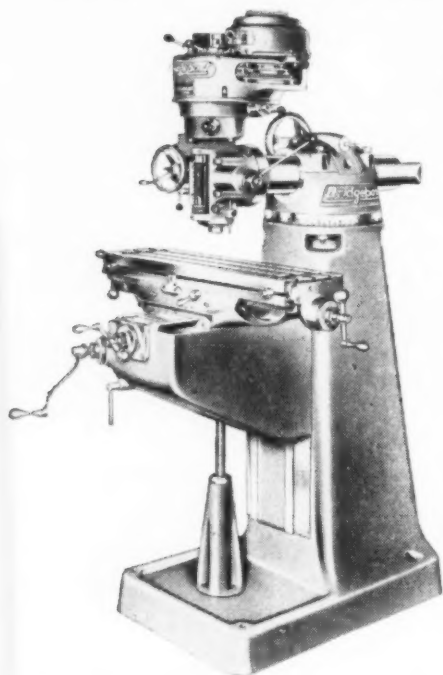
WORKS HOLLAND, MICHIGAN

TAPPERS • UPRIGHT DRILLS • ENGINE LATHES

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These NEW DEVELOPMENTS
mean even greater utility

Bridgeport



The Bridgeport Turret Milling Machine with its New 1 H.P. Milling, Drilling and Boring Attachment has had its remarkable versatility still further extended through the development of Cherrying and Right Angle Attachments shown at work here. Furthermore the new Bridgeport Milling Machine Vise and Boring Head add greater convenience and capacity to a machine which has already found outstanding acceptance in the World's leading die shops and tool rooms as well as on the production lines of countless metal working shops.

Full details are available on request.

Booth No. 1031 A.S.T.E. Show

CHERRYING ATTACHMENT

Designed for producing concave and convex shapes. Specially useful in producing drop forge dies, molds and cavities, metal core boxes, etc.



HEAVY DUTY RIGHT ANGLE ATTACHMENT

For milling and drilling at right angles.



LIGHT DUTY RIGHT ANGLE ATTACHMENT

Specially designed for milling and drilling narrow, deep molds and cavities.

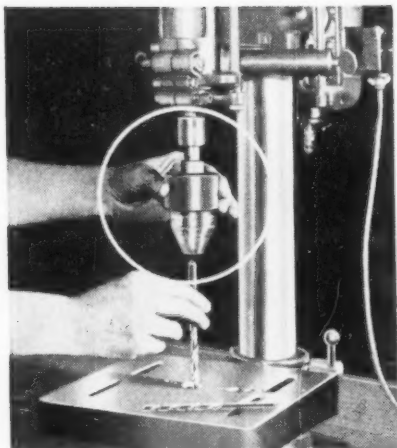


***Bridgeport* MACHINES, INC.**

Bridgeport, Connecticut

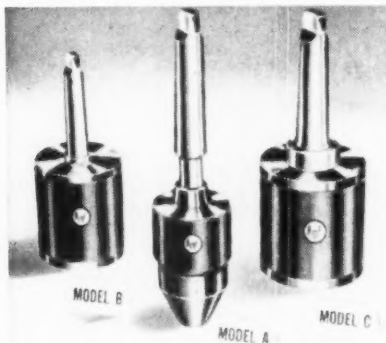
Manufacturers of High Speed Milling Attachments and Turret Milling Machines

Change drills in a second, safely with this Automatic Chuck while spindle is running



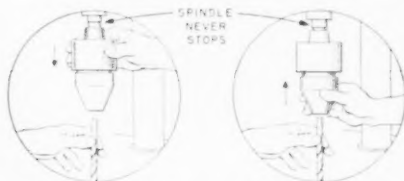
AMF Wahlstrom Chucks are rugged tools, proven out in many years of heavy production work. Simple construction assures ease of operation.

THESE WAHLSTROM TOOLS CUT COSTS, TOO



Wahlstrom Chucks are available in several size ranges:
Model A—1/32" to 1/2" ; Model AA—1/64" to 3/8"
Model B—15/64" to 1/2" ; 3/8" to 3/4" ; 17/32" to 1"
Model C—Holds any size tool with No. 1, 2, or 3 M.T. Shank.

HERE'S ALL THERE IS TO CHANGING DRILLS



1. Grip sleeve—pull down
—jaws open automatically
—drill is released.

2. Insert new drill—push
up tapered part—drill is
locked in place.

You don't stop the machine to change drills with the AMF WAHLSTROM CHUCK. No keys, collets or wrenches are needed.

That's why Wahlstrom Chucks cut costly minutes in changing tools for drill press work or for spotting, drilling and reaming in boring or milling machines. They'll also save money in lathe work for burring, turning, filing, etc. *One spindle does the work of several.*

Tools last longer, too... smooth, hardened and ground jaws grip tight without chewing into tools. Grip increases with the load.

For fast, uninterrupted production, use the quick-change AMF WAHLSTROM CHUCK. It is the only fully automatic drill chuck which holds the widest range of straight shank tools...Model A—1/32" to 1/2" ; Model AA—1/64" to 3/8"

**See your local distributor or write today
for Bulletin 56-4**

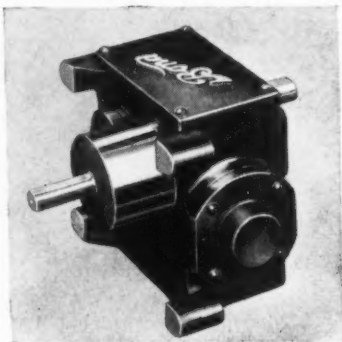
WAHLSTROM TOOL DIVISION, AMERICAN MACHINE & FOUNDRY CO.
5502 SECOND AVENUE BROOKLYN 20, N. Y.

**See the WAHLSTROM CHUCK at the
ASTE show, Booth No. 659.**

WAHLSTROM
fully automatic
DRILL CHUCKS

NO KEYS, COLLETS OR WRENCHES

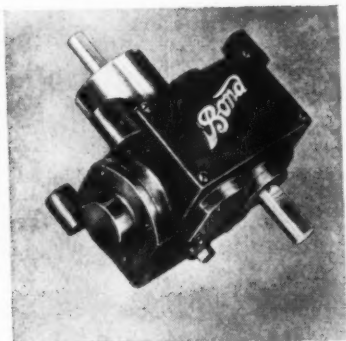




BRAND NEW

BY

Bond



CUT YOUR LABOR COSTS

This **DOUBLE REDUCTION SPEED REDUCER** is specially designed to cut your time of assembly. It is equipped with a $2\frac{1}{4}$ " diameter **MACHINED PILOT** on the high speed shaft to insure accurate shaft position when mounted with shaft extending through a wall or casing. **MOUNTING LUGS** are on the same side of the unit so no base is necessary, just bolt it to the side of your casing with high speed shaft extending through the wall or casing.

The high speed shaft of this reducer is provided with **BALL BEARINGS, OIL SEALED. BALL THRUST BEARINGS** are on both ends of the intermediate shaft to take care of end thrust. This unit at the present time is being manufactured with a **NON-METALLIC WORM GEAR** on the high speed, first reduction side, so that this unit is extremely desirable for **DOMESTIC** installation because of the lack of noise. All shafts are milled flat for set screws. The unit weighs about 12 pounds. It has the following approximate dimensions: $5\frac{7}{8}$ " long x $3\frac{3}{4}$ " wide x 5" high. It comes in standard ratios of 25, 50, 100, 150, 160, 200, 300, 400, 600, 900 & 1764 to 1.

WHY NOT GIVE THIS UNIT A TRY. We think you will find it highly satisfactory. Write for further detailed information on this unit, and let us quote you on your requirements. Send all inquiries to **CHARLES BOND COMPANY**, Attention: Gear Department.

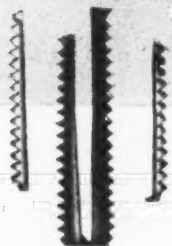
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CHARLES

Bond
COMPANY

617-623 Arch Street

Philadelphia 6, Pa.



By the **ELOX** METHOD

The Elox method of removing a broken tool from a part being machined might very aptly be called "Disintegrator Drilling". It makes no difference how hard the broken tool may be. A core is drilled down through it by the Elox electrical disintegrator and the core removed. Then the remaining strips of thread of a tap or the cutting flutes of a drill or reamer are easily collapsed and picked out of the hole.

This method does not in any way damage the metal of the work part or the work already done on it. The temperature of the metal of the work part is not raised sufficiently to cause any metallurgical change.

The Elox method is also used to "drill" holes of various shapes in hardened dies and machine elements without annealing.



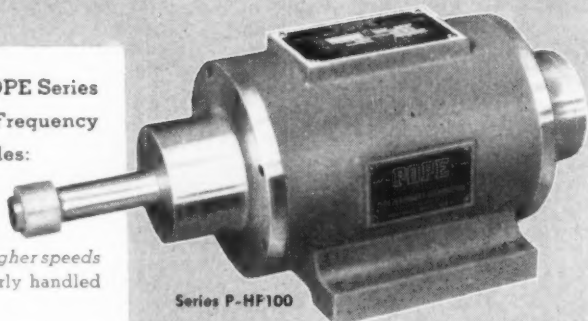
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ELOX CORPORATION **744 N. Rochester Road**
Clawson, Michigan
Phone, Detroit: JORDAN 4-6173

New! HIGH FREQUENCY POPE PRECISION SPINDLES

Specify POPE Series
P-HF100 High Frequency
Motorized Spindles:

- when you need *higher speeds* than can be properly handled by belt drive.
- when *more efficient* internal grinder spindles are wanted.
- when a *more compact* spindle package is desired.



Series P-HF100

POPE High Frequency, Series P-HF100 Internal Grinder Spindles are regularly furnished in speeds from 5400 to 54,000 R.P.M.

POPE designs and builds *special* High Frequency Spindles for a wide range of applications, a few of which are described below.



P-5681

POPE High Frequency Direct Motorized Cartridge Type Spindle with 1 HP motor at 7200, 10,800, 14,400 and 21,600 RPM, using 240 and 360 cycle current in combination with a two-pole, four-pole motor.



P-693

High Frequency 16,600 RPM totally enclosed fan cooled 1 HP motorized Spindle, over-all length 18 $\frac{1}{2}$ " barrel dia. 3" barrel length 9"



P-1932

High Frequency 18,000 RPM totally enclosed, fan cooled $\frac{1}{2}$ HP motor Spindle arranged for vertical operation with the grinding wheel or tool at the upper end. Length 15 $\frac{1}{2}$ " barrel dia. 2 $\frac{1}{2}$ " barrel length 7 $\frac{1}{2}$ " POPE sealed-in lubrication.



P-5552

POPE Heavy Duty, High Frequency, Direct Motorized, Cartridge Type Milling Spindle 14,400 RPM, 15 HP totally enclosed, water cooled motor, 240 cycles, 3 phase. Oil mist lubrication.

When You Want A High Frequency Spindle, Let Us Have Your Specifications And We'll Provide Recommendations And Quotations.

No. 67

POPE

TRADE MARK REG. U.S. PAT. OFF.

POPE MACHINERY CORPORATION

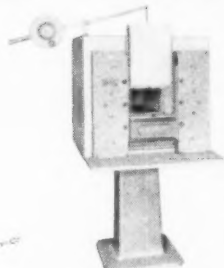
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261 RIVER STREET • HAVERHILL, MASSACHUSETTS
BUILDERS OF PRECISION SPINDLES

FOR LONGER TOOL LIFE, LOWER TOOL COSTS, AND QUALITY HIGH SPEED STEEL HARDENING . . .



Sentry Model "2Y" — For hardening small tools and cutters of moly, tungsten and cobalt high speed steels.



Sentry Model "5Y" — For handling larger tools and cutters. Flexible, economical, quick to heat up.



Sentry Model "YP"—Vertical Furnace for hardening long, slender drills, reamers, broaches, etc.

SENTRY A17 ELECTRIC FURNACES

Sentry Electric Furnaces produce quality hardening, maximum toughness and exceptional durability in high speed steel and high carbon high chrome. Edges stand up longer which means less frequent grindings, longer tool life and lower tool costs.

Sentry Furnaces utilize Sentry Diamond Blocks permitting full soaking of tools without danger of burning. No scaling. No decarburization. Produce a clean finish which eliminates finishing operations.

Ask for catalog D17

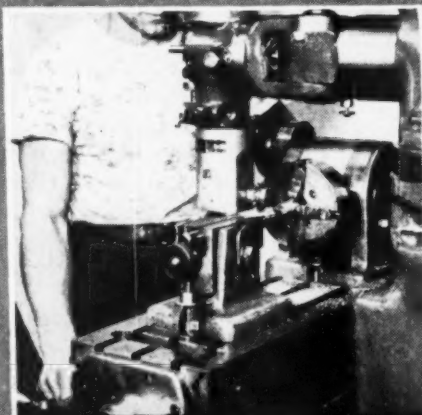


The Sentry Company

FOXBORO, MASS.. U.S.A.



YOUR MILLING MACHINE CAPACITY *DOUBLED!*



Milmaster
FOR VERTICAL AND
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Convert your milling machine...horizontal or vertical...into a universal miller and *double* your capacity. Reduce set-up time by as much as two-thirds.

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Please send me the bulletin giving the full details on the Milmaster.

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Company

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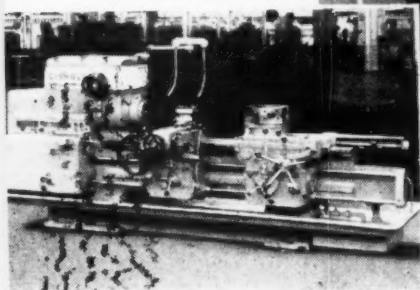
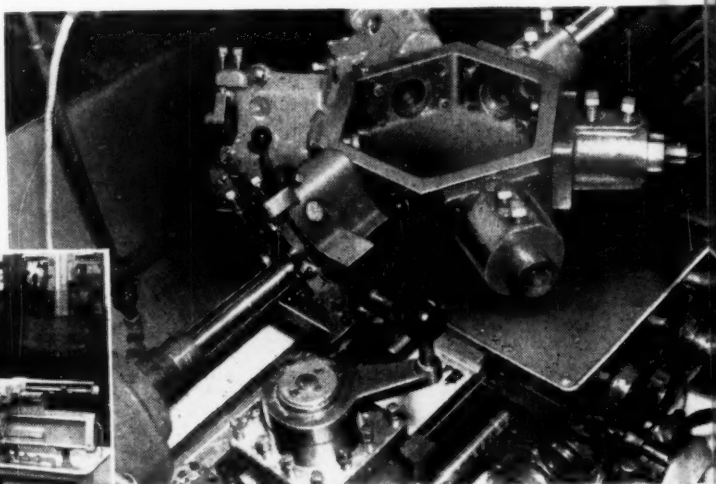
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*take shaft jobs
Like This:*

they take less time on **GISHOLT TURRET LATHES**

*Yes, even in lots as small as
5 or 10 parts, you can't beat
turret lathes on this kind
of work. Parts are machined
complete in 2 operations—
total time is less than 4 min.*



no extra equipment needed!

With no more than your standard bar equipment, you're all set to cut machining costs on shafts like these. No previous operations . . . such as cutting to length or centering . . . are necessary. And with *two or more* tools from turret and side carriage, you have the basic advantage of turret lathe economy—the time saving that means lower costs.

Before you turn to extra equipment or special attachments, look into the possibilities of doing the job the quick and easy way on Gisholt Turret Lathes. Gisholt engineers will gladly help you.



THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcomed here.



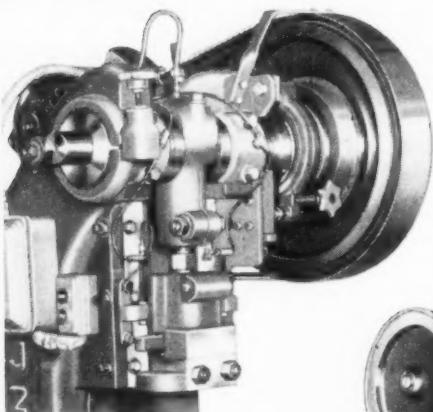
**TURRET LATHES • AUTOMATIC LATHES
SUPERFINISHERS • BALANCERS
SPECIAL MACHINES**

GISHOLT MACHINE COMPANY

MADISON 10, WISCONSIN

NEW!

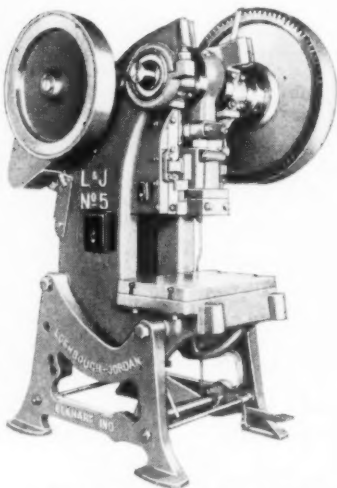
FRICTION CLUTCHES on L & J PRESSES



Now available as optional equipment on all models, they offer these advantages: 1. Higher speeds. 2. Adjustable to prevent overloading. 3. No heating. 4. Less starting shock. 5. Positive disengagement; safer. They're the answer to faster, cheaper stamping.

L & J PRESSES for Low-Cost Production

You'll save man-hours and die wear with these ruggedly built O.B.I. presses. They are easy to operate, fast and require a minimum of service. Precision slides, extra long gibs and high deflection resistance insure perfect die alignment. Available in 6 to 80 ton capacities. Illustrated: No. 5 Backgeared with standard clutch. Write for literature.



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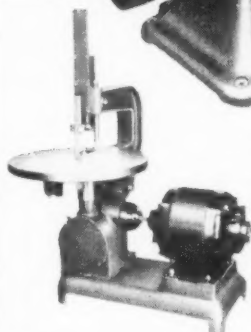
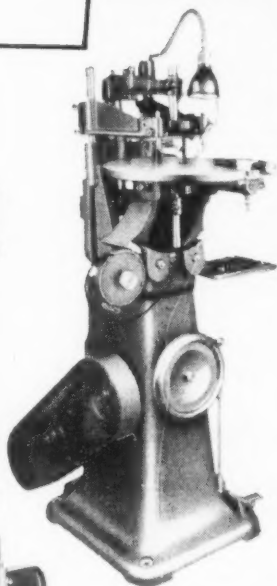
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SUCCESSORS TO LOSBROUGH-JORDAN TOOL & MACHINE CO. ESTABLISHED 1910

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**OLIVER
OF
ADRIAN**



The precision built OLIVER DIE MAKERS are highly recommended by users in "cost conscious" plants. They report greater production, higher quality work, and in some cases over 60% reduction in costs. Why? Because OLIVER DIE MAKERS are faster, more accurate, less operator's fatigue, and return their investment faster.

OLIVER DIE MAKERS are built in five different models to meet every industrial requirement.

Two models are illustrated. The Heavy Duty Oliver Die Maker, which has 6 speeds, works in metal up to 3" thick, has variable strokes to 5", plus hydraulic feed. The Oliver Bench Model S-1 is a single speed die maker for use on tool steel up to 1" thick.

Write today for complete technical information.

OLIVER INSTRUMENT CO.

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**AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL
POINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIEMAKING MACHINES**



GET BETTER PRODUCTION from **PRECISION CHECKING**

Pump Rotors Checked to within .0005" on SUNDSTRAND BENCH CENTER

Simplify assembly, lower spoilage and get better production from this modern Sundstrand Bench Center. For instance, this manufacturer of pumps checks the concentricity of the O.D. of the pump rotors within .0005" with the spline and checks side runout with the spline to within .0005". You'll check work between centers easier, faster and within

limits of .0001" on this improved Sundstrand Bench Center.

"One-hand control" over all movable elements leaves the operator's second hand free to control rotation of the part being checked. Either headstock or tailstock can be unclamped, positioned and locked in place with a single hand operating the top lever. Investigate this bench center today.

AVAILABLE IN THE FOLLOWING SIZES

6" x 18"	12" x 36"	12" x 60"
6" x 36"	12" x 48"	12" x 72"

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Get complete specifications and additional features from this circular. Write for your copy today. Ask for Bulletin No. 494.



SUNDSTRAND

MACHINE TOOL COMPANY

2535 Eleventh St. • Rockford, Ill., U. S. A.

LOOK AT THIS PRESS

It's designed to provide industry with low-cost, high production units that are highly flexible in design and operation...relieving heavier presses of short runs and lighter work. Presses are practically fool-proof in operation. Frame is extremely rugged. Fingertip controls are conveniently located at hand level. Available for immediate delivery, in standard width (between up-rights) of 24"—31"—36"—42" respectively. Available in special width up to 72" at small additional cost. Movable bed plates. Pumping unit has by-pass relief valve which can be set at any pressure up to press capacity. All Standard presses equipped with 2-speed built-in hand pumps for more sensitive and versatile operation.

READ THESE "SPECS":

CYLINDERS: *Standard Models* furnished with 6" bore, 7½" stroke—spring return type; also 5" bore, 7½" stroke—spring return type. Above presses are standard. Following can be furnished at additional cost: Double Acting, 6" bore, 7" stroke; 6" bore, 11" stroke; 5" bore, 7" stroke; 5" bore, 11" stroke. Special long stroke cylinders also available, up to 48" in length, for incorporation in suitable press frames of our make. **PUMPING UNITS:** These units can be supplied in various volumes and pressures, in a total of 13 combinations.

CHECK THESE USES:

There are so many everyday production uses for these versatile KRW Hydraulic Presses that we have lost count. Here are a few of the more obvious...blanking, forming, bending, broaching, straightening, stamping, embossing, numbering, upsetting, laminating, pressing and hot or cold forging.

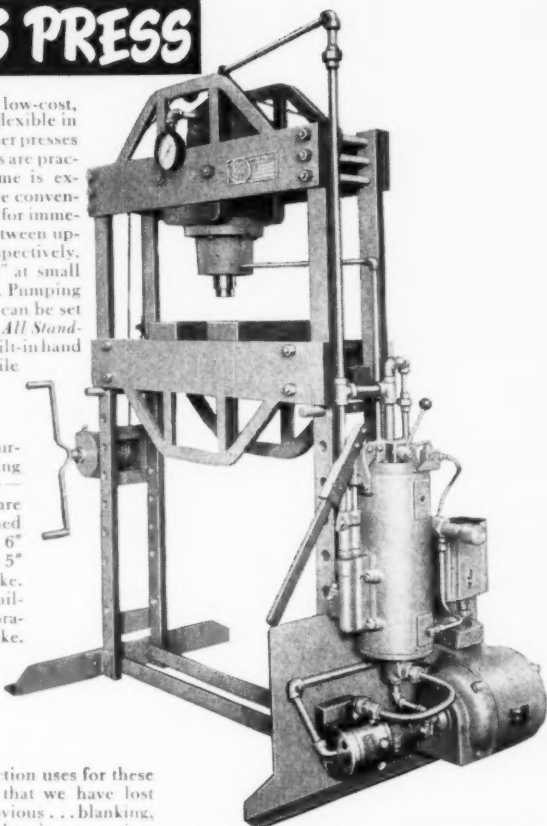
BEAT THESE PRICES*:

Depending upon capacity of pumping equipment, prices of Standard model motor driven hydraulic presses are as follows. F. O. B. Factory: 25-ton press from \$727.00 to \$992.00. 50-ton press from \$806.00 to \$1058.00. 60-ton press from \$1070.50 to \$1135.00. 75-ton press from \$1198.00 to \$1258.00. All motors in the above units are 220/440 volt, 3 phase, 60 cycle. Any change in motor specifications is extra.

*Subject to change without notice.

K·R·WILSON

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MAIL THIS COUPON

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215 Main St., Buffalo 3, N. Y.

Please send me complete information on
KRW Motor Driven Presses as follows:

- ☐ 25-ton ☐ 50-ton ☐ 60-ton
☐ 75-ton presses ☐ Press Cap.
☐ motor drive conversion unit

Serial No. _____

Name _____

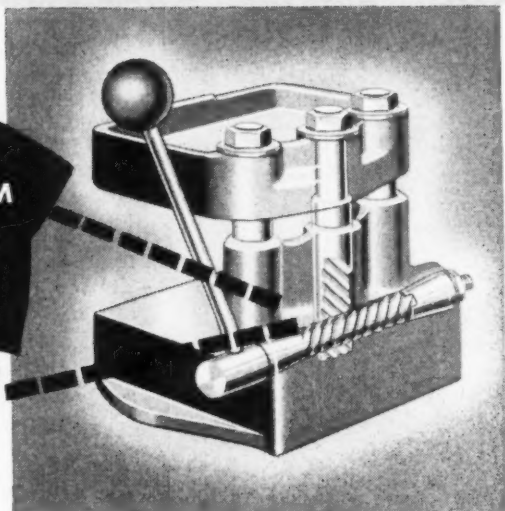
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MECHANISM
WEARS IN
—NOT OUT**

"CONE-LOK"



THE JIG WITH A LIFETIME* *Guarantee* ON THE LOCKING MECHANISM

● Just think of this. It's no longer necessary to carry an inventory of spare parts. And when you eliminate costly inventory you save again in storage space and taxes! Add to this the saving on maintenance costs and down time on production. Don't overlook these values when planning your 1950 program. Write for literature, complete details.

* We absolutely guarantee forever the locking mechanism on the Cone-Lok.

WOODWORTH

N. A. WOODWORTH CO. • 1300 EAST NINE MILE ROAD • DETROIT 20, MICHIGAN
PRECISION GAGES • DIAPHRAGM CHUCKS • CONE-LOK JIGS • PRECISION PARTS

STEPHENSON SPECIFIES NORGREN REGULATORS

...because they lick
air pressure "creep"

Take a tip from The Stephenson Air Brush Paint Co. of Oakland, Calif., "Two years ago we tried Norgren Regulators on our R.M.S. Surge Control Units and discovered many worthwhile advantages: (1) They ended pressure "creep" in air lines; (2) They are compact (3) We have never had a complaint about their performance."

NORGREN PRESSURE REGULATORS

- 1 Permit greater air flow with less pressure drop than other regulators of comparable size ports and diaphragm.
- 2 Respond faster, without shock or chatter.
- 3 Install direct in air line; dismantle without removal from line.
- 4 For reducing pressures of up to 400 p.s.i. to working pressures of up to 250 p.s.i.
- 5 Types for air, liquids, steam, welding, butane-propane.

WRITE C. A. NORGREN CO., 238 SANTA FE DRIVE, DENVER 9, COLO.

Norgren

Also Filters, Lubricators,
Valves, Hose Assemblies.

30 SECOND BLADE CHANGES

Kalamazoo

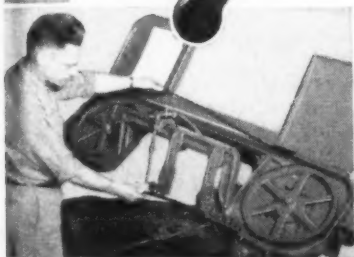


**METAL
CUTTING
BAND
SAW**

KALAMAZOO
MODELS —
816-S — 824-S
(COOLANT
EQUIPMENT
AVAILABLE)

Time means money. You save both with Kalamazoo Band Saws. An exclusive feature of design permits blade changes from the top *in 30 seconds*. This is but one of many exclusive Kalamazoo features giving you faster, more accurate, and lower-cost cutting of light or heavy bars, angles, tubes, pipe, or rounds.

Handles 95% of all cutting jobs! No burr, minimum kerf. No yoke or frame hides work from view. All-Timken bearing drive unit. Kalamazoo Band Saws are standard money-saving equipment in thousands of plants. Ruggedly built, easily portable. Write today for full details.



MACHINE TOOL DIV. *Kalamazoo* TANK and SILO CO.

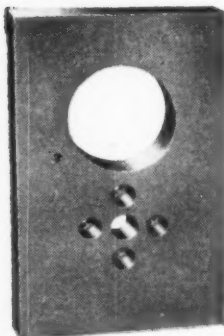
321 HARRISON STREET

KALAMAZOO 16, MICHIGAN

3

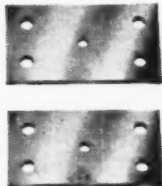
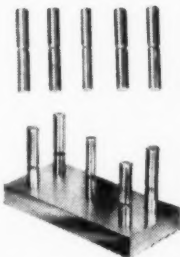
Hole Grinding Problems

**CAN YOU
ESTIMATE
THE TIME?**



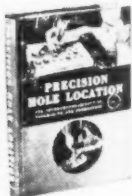
TWO-STATION DIE BLOCK

All holes ground to exact size and location. Blank hole and center piercing hole ground with one half degree included taper. Little clearance permissible between punch and die. 2 1/4 hrs. on the Moore Jig Grinder.



TEN HOLES IN MASTER PLATES

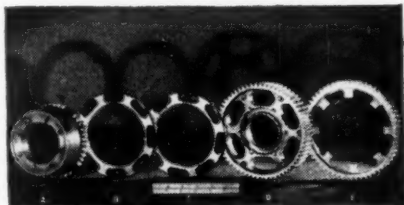
Hardening distortion corrected in two plates. Ground to size and location independently and to plug gage fit in any of the four possible positions. 3 1/2 hrs. on the Moore Jig Grinder.



HAVE YOU BOUGHT YOUR COPY OF "PRECISION HOLE LOCATION"

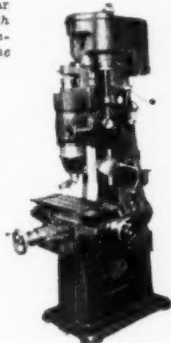
An entire chapter of this authoritative handbook on toolmaking practices is devoted to an engineered solution to the problem of correcting holes by jig grinding. Over 5,000 copies have been sold to date. Available at special price of \$3 in U.S.A.; \$3.50 outside U.S.A. 448 pages, over 400 illustrations, 184 pages of Woodworth Co-ordinate Location Tables from 3 to 100 holes.

Send check or money order to Moore Special Tool Co., Inc., Bridgeport 7, Conn.



FIVE ACCESSORY GEARS IN MASS-PRODUCTION

Gear A: Eight holes on circle ground to size and location within $\pm .0003$ ". Gears B, C, D, E: Radii at ends of elongated pockets ground to size and location within $\pm .0003$ ". Gears B, C: Radii ground to shoulder near bottom of pocket within $\pm .0005$ ". With special indexing fixture, 4 aircraft engine gears per hour finished on the Moore Jig Grinder



"Correcting Hole Location Within Less Than .0001" is the title of our new 28-page catalog which describes the operation and applications of the Moore Jig Grinder to dies, drill jigs, gage parts, master plates and production parts. Write for your copy today.
MOORE SPECIAL TOOL CO., INC., 728 UNION AVENUE, BRIDGEPORT 7, CONN.

Visit The Moore Exhibit At The ASTE Show, Booth 1007.

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JIG BORERS JIG GRINDERS HOLE LOCATION ACCESSORIES
DIE FLIPPERS MOTORIZED CENTERS PANTO-CRUSH WHEEL DRESSERS

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NEW COLLET CHUCK'S GREAT GRIP IMPROVES PERFORMANCE ON YOUR LATHE

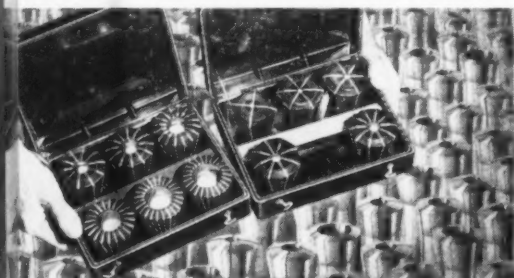
Developing the tightest, most accurate grip ever devised in lathe collet equipment, Jacobs' new Spindle Nose Lathe Chuck delivers from two to four times more torque than split steel collet chucks.

Work cannot slip under the heaviest cuts of the most modern tool room lathes. Despite this ruggedness, the unique design of the collets allows the softest, most fragile materials to be chucked without marring or scratching.

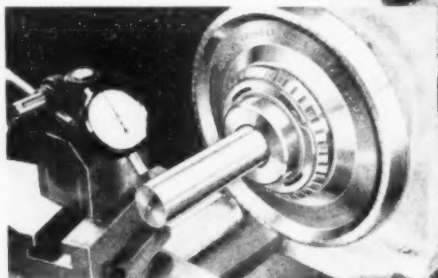
A big order? Certainly . . . but it's filled perfectly by this remarkable new chuck with

its unique Rubber-Flex Collet. Multiple alloy steel jaws, hardened and ground, are bonded and mechanically locked together by Hycar synthetic rubber which will not set and is unaffected by heat, coolants or cutting oils. The collet's extra long steel jaws are always parallel to the work and the gripping load is thus distributed over the entire bearing surface. Result: accuracy and gripping power never before obtained in lathe collet chucks.

See your Jacobs distributor for bulletin 49-LC describing this new Lathe Collet Chuck.



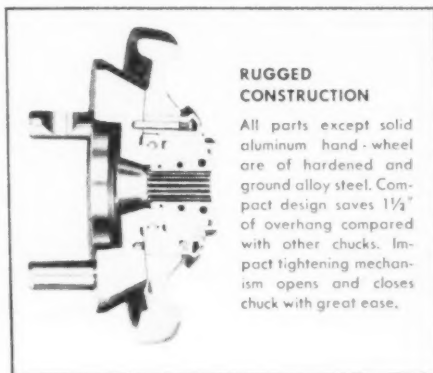
SO FEW DO SO MUCH . . . Each Jacobs Rubber-Flex Collet has a capacity of $\frac{1}{8}$ ". Its grip is constant throughout this range. Only eleven collets are needed to chuck any bar from $\frac{1}{8}$ " to $1\frac{1}{8}$ " diameter . . . contrasted with the 88 split steel collets needed to equal this chucking capacity by $\frac{1}{64}$ ths!



UNMATCHED ACCURACY . . . This chuck is designed to allow an unusual control of runout — it is the most accurate lathe collet chuck in the world today. The body is made from a single alloy steel forging. All bearing surfaces of the chuck and collets are of alloy steel, hardened and ground.

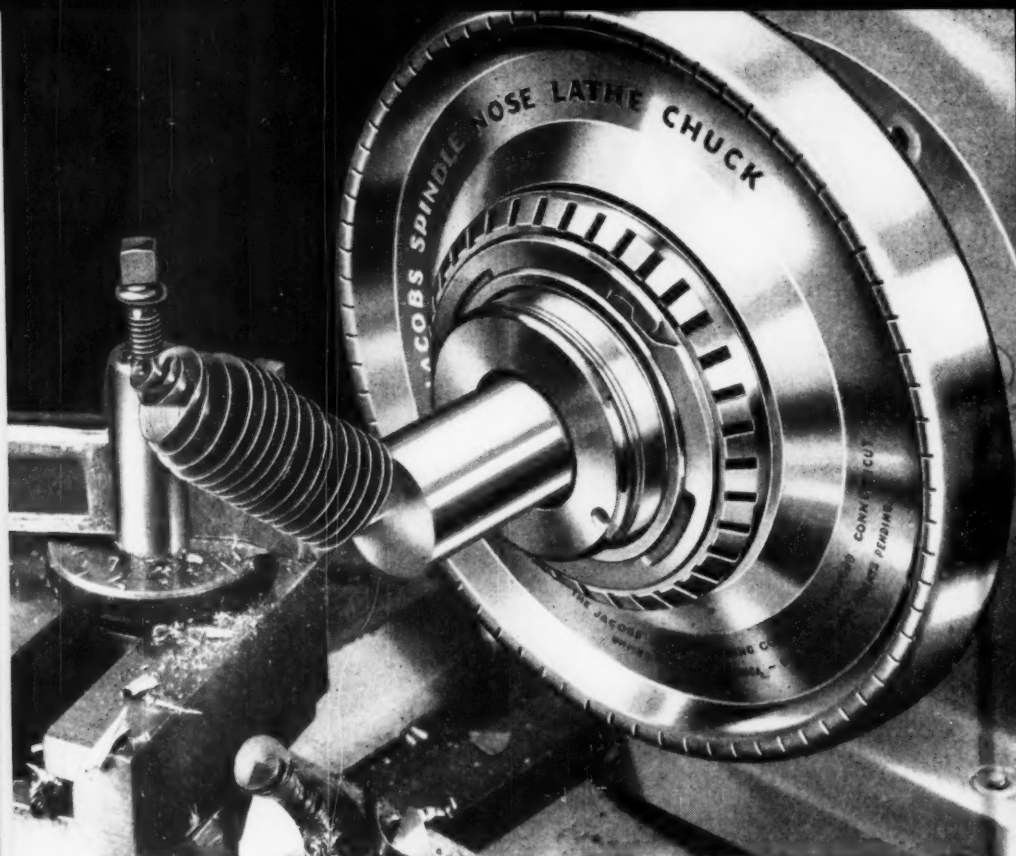


UNIFORM GRIPPING PRESSURE . . . permits the chuck to hold thin-walled tubes, plastics, wood and other fragile materials with no danger of marring or scoring. Grip is so evenly applied around circumference of work, no denting is possible.



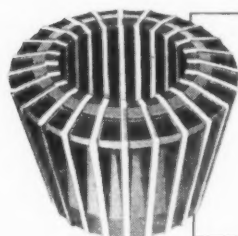
RUGGED CONSTRUCTION

All parts except solid aluminum hand-wheel are of hardened and ground alloy steel. Compact design saves $1\frac{1}{4}$ " of overhang compared with other chucks. Impact tightening mechanism opens and closes chuck with great ease.



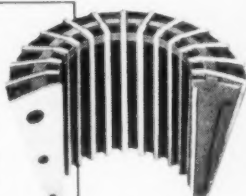
MAXIMUM FEEDS AND SPEEDS . . . Pictured above is a 1 1/4" cold rolled bar being removed in a single pass with a

feed of .008". Only the tremendous gripping power of the Rubber-Flex Collets permits this remarkable feat.



THE JACOBS RUBBER-FLEX COLLET

1. All external and internal surfaces precision ground.
2. The jaws in all collets have extremely long bearing surfaces in relation to the diameter.
3. Collet jaw bearing surfaces always parallel to and in full contact with work, assuring accuracy and gripping power.



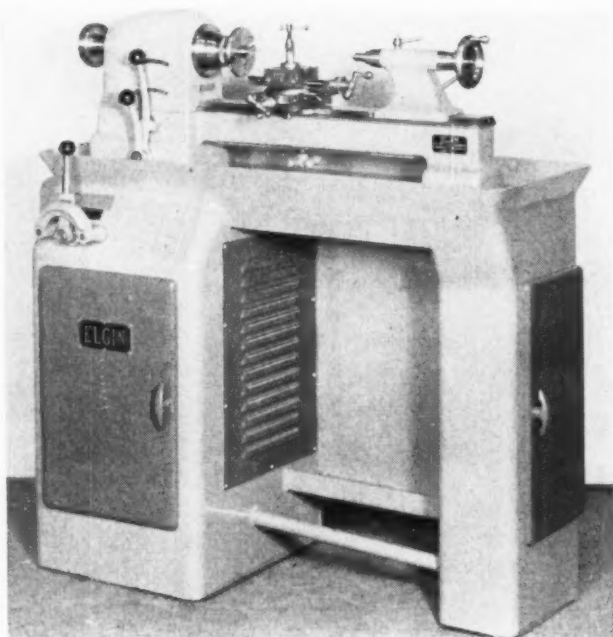
The *Jacobs* SPINDLE NOSE LATHE CHUCK

THE JACOBS MANUFACTURING COMPANY
30 Jacobs Road, West Hartford 10, Connecticut

If it's a JACOBS . . . it holds!

ELGIN NOW PROVIDES OPERATOR

COMFORT.

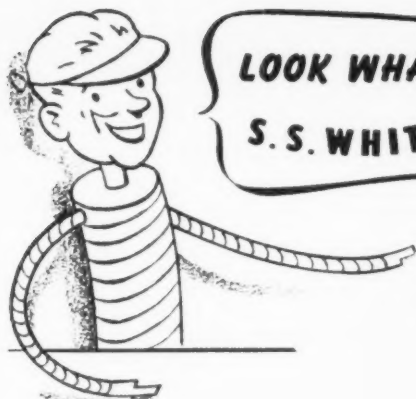


- The "Elgin Line" now is furnished with knee-hole bases with foot rests, permitting operator to sit comfortably, close-up and directly in front of work.
- Motor is mounted in base with direct cross ventilation.
- Three shelves are provided on right hand side.
- Collet board is on left hand door, below the convenient centralized controls.
- Variable speed drive provides stepless spindle speeds from 40 to 4000 rpm.

Write for full details.

ELGIN TOOL WORKS

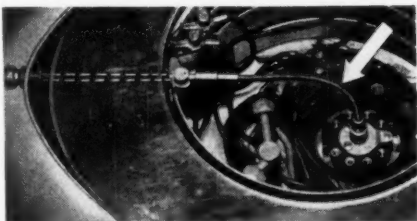
1772 BERTEAU AT RAVENSWOOD AVE. — CHICAGO, 13 ILL.



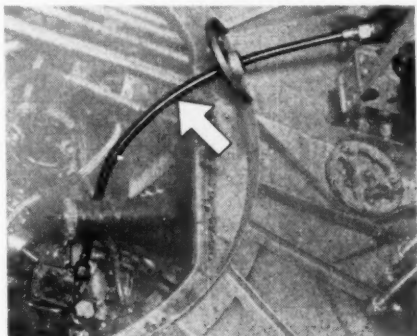
LOOK WHAT CAN BE DONE WITH S.S. WHITE FLEXIBLE SHAFTS

Engineers will find many valuable uses for S.S. White flexible shafts in equipment design. Two cases in point are shown at the right. These smooth operating, readily adaptable mechanical elements come in a wide range of diameters and characteristics and can be supplied to your specific length requirements.

BULLETIN 4501 gives basic details on flexible shaft selection and application. Write for a copy.



REMOTE CONTROL of an inaccessible part can be accomplished with a single flexible shaft, as shown here.



POWER DRIVE — Power can be taken from one point and delivered to another with an easily applied flexible shaft combination. A typical example is shown.

S.S. WHITE INDUSTRIAL DIVISION
THE S. S. WHITE DENTAL MFG. CO. DEPT. H, 10 EAST 40th ST., NEW YORK 16, N. Y.



FLEXIBLE SHAFTS AND ACCESSORIES
MOLDED PLASTICS PRODUCTS—MOLDED RESISTORS

One of America's AAAA Industrial Enterprises

HENDEY
No. 2
GENERAL
PURPOSE
LATHE



Let's talk 'PRICE'

A good lathe costs money. The new Hendey No. 2 General Purpose Lathe is not an exception, but is an exceptional value. This lathe is an entirely new concept.

It replaces the famous Hendey Cone Head Lathe, but retains all the facility—with a single lever belt shifter. It has eight speeds, but no expensive geared head. A unique feature eliminates belt pull on the spindle. There are 48 thread and feed changes, and graduations permit spindle indexing for cutting multiple threads. The Bed Ways, both Carriage and Tailstock, are hardened and precision ground. Here's a lot of lathe for the money—the price will please. Write today for details and catalog.

PRINCIPAL DIMENSIONS

Rated size	14"
Swing over ways	16 ⁷ / ₁₆ "
Swing over cross slide	10 ¹ / ₂ "
Spindle bearings—Preloaded super-precision roller bearings	
Spindle nose	L-1 taper nose
Hole through spindle	1 ¹ / ₂ "
Range of spindle speeds	30 to 1142 R.P.M.
Carriage bearings on ways	21 ¹ / ₂ "
Width and length of cross slide	7"
Compound rest travel	4"
No. of thread and feed changes	48
Range of thread cutting	1 ¹ / ₂ to 92

THE *hendey* MACHINE COMPANY

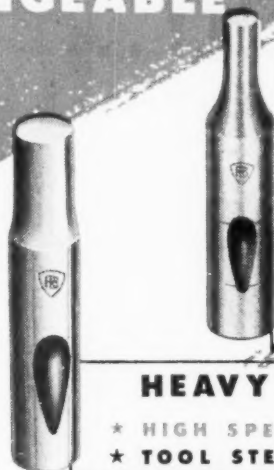
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INTERCHANGEABLE PUNCHES and DIES






STANDARD




★ HIGH SPEED
STEEL
★ TOOL STEEL

HEAVY DUTY

★ HIGH SPEED STEEL
★ TOOL STEEL

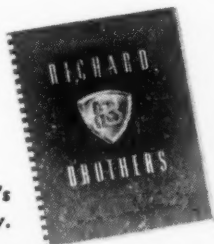
HAS THEM

If you require either  standard round punches (for piercing up to $\frac{1}{8}$ " thickness) or  heavy duty round punches (for over $\frac{1}{8}$ ") they are available in either water-hardening tool steel or high speed steel. With this broad selection you can economize on nearly all your piercing applications by relying entirely on  punch and die interchangeability.

If you have questions regarding which type of standardized  interchangeability punch die is best suited to your needs, let our engineering staff help you. Or, if you need special punches or dies, with or without the  interchangeability feature,  can produce them promptly—in any size, shape or material.

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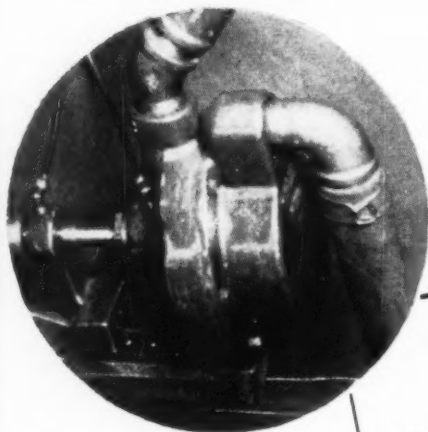
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SAVE WISELY ... SAVE SAFELY

with



By-Pass, Oil-Relief VALVES



Write on your letterhead for
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DATA BOOK.

THE



Specialties Co., Inc.
BLANCHESTER, OHIO



It pays . . . and pays well . . . to install FULFLO valves. Install — choice of five springs for predetermined pressure — and these valves will work uniformly and constantly to maintain required pressure. CHATTERLESS.

Pipe sizes: $\frac{1}{4}$ " to 2" standard pipe thread.

STD 300# American Flange Valves
1" to 2 $\frac{1}{2}$ ".

FULFLO CENTRIFUGAL COOLANT PUMPS

Numerous designs for practically any cooling purpose to save wear on tools and products. Pipe sizes: $\frac{3}{8}$ " to 1 $\frac{1}{2}$ ". Right or left rotation. Direct, belt or motor drives.



Rotor's 15 New "Multi-power" Chippers are easier to handle . . . do jobs faster

● The unique hollow piston and "doughnut" valve of the 15 new Rotor "Multi-power" Chipping Hammers provide the 1-2 punch to cut your chipping costs.

Lighter Weight. These new Rotor Chippers average 1½ to 2 lbs. lighter than other chippers making them easier to handle.

Shorter. Exclusive "doughnut" valve makes possible saving of 1" to 2" in length, making it easier to get into those tough, crowded corners.

Faster Cutting. You get more blows per minute . . . because of new exclusive design.

3 Models in 1. By a simple change of parts you can adapt each of the 5 basic models to serve as 3 hammers to match your job: (1) A "regular" model, (2) A "super-speed" model, (3) A "super-sock" model.

This is the biggest advancement in chipping hammers in the past 15 years! Find out all about it! Write for catalogue No. 37.

AIR O'TOOL

AIR

THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

HIGH
CYCLE

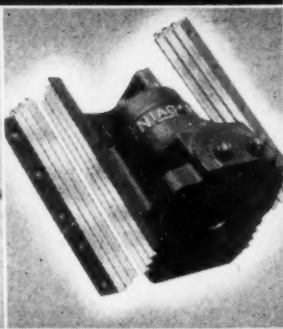
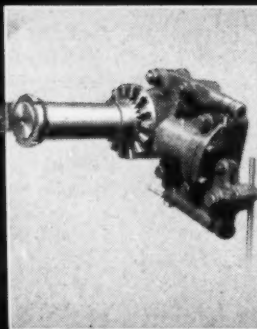


ONLY

● You get the same advanced design in small Niagara Inclinable Presses as you get in the largest sizes. Don't overlook the importance of this because small presses run as much as 6½ times as fast as large presses. Regardless of size you get quality when you get Niagara Inclinable Presses.

Instant Engagement of the Sleeve Clutch as compared with the slower action of other mechanical press clutches produces more work strokes per hour.

Multiple "V" ribs provide more guiding surface which minimizes wear, maintains alignment of slide with bed and thus increases die life.



NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

NIAGARA

SMALL INCLINABLE PRESSES

Give you all these

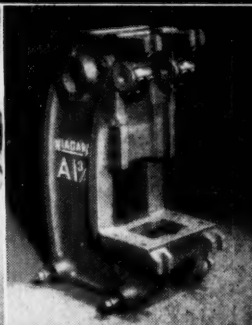
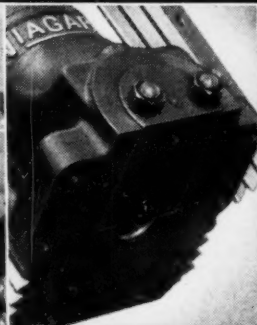
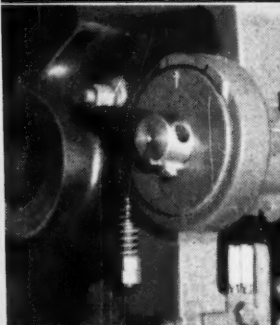
BIG PRESS FEATURES

Breake automatically compensates for wear as well as expansion due to heat of operation. Drum and hand marked to indicate correct adjustment.

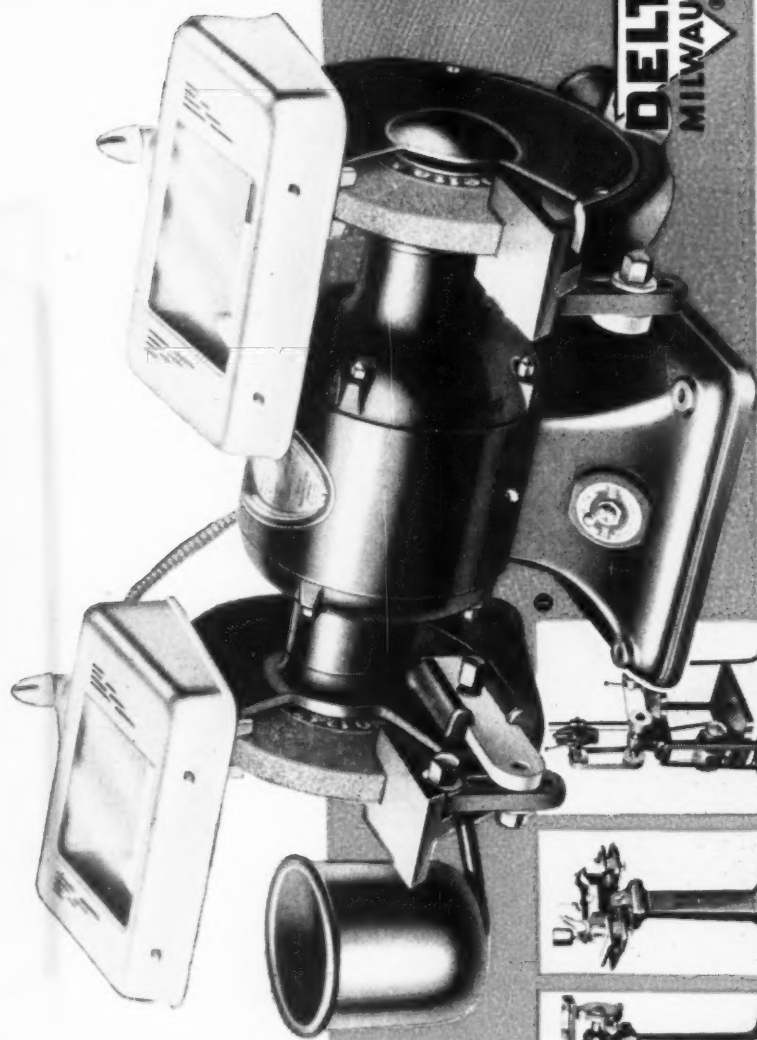
Slide designed to assure solid backing for die from center to front as well as rear. Breech block die clamp gives solid backing to punch shoe.

Frame designed to provide solid gib mountings, strength at the crankshaft bearings and a rigid gap maintaining close alignment of punch and die.

Inclining mechanism easily operated by one man. Working height is not materially changed when press is inclined.

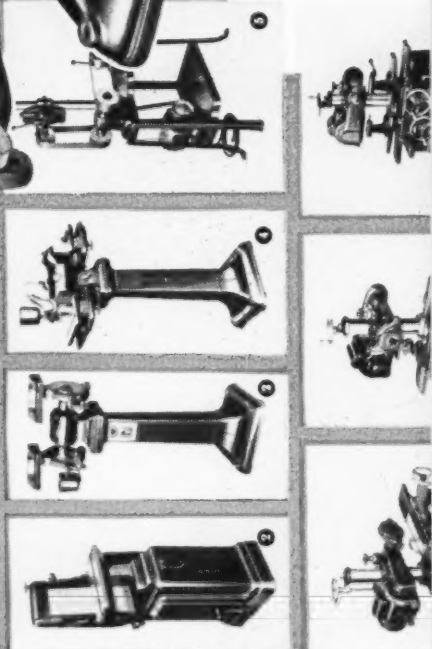


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DELTA® - the most complete line

have a grinder with the current and speed



- ① Delta-Milwaukee Tool Grinder with Twin-Lite® Safety Shields (bench model) \$ 95.00
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 ⑧ Delta-Milwaukee Toolmaker® Tool-and-Cutter Grinder \$425.00

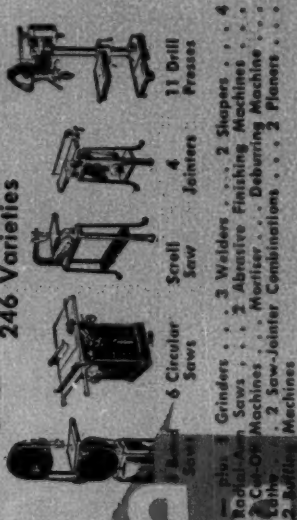
Motor and switch extra in some cases.
 Prices subject to change without notice.

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for the right machine for your job

53 MACHINES

246 Varieties



- plus 3 Grinders . . . 2 Welders . . . 4
 Radial-Arm Saws . . . 2 Abrasive Finishing Machines . . .
 Cut-Off Machines . . . Mortiser . . . Deburring Machine . . .
 Lathe . . . 2 Saw-Jointer Combinations . . . 2 Planers . . .
 2 Milling Machines

Need a grinder for toolroom or production work? Delta's got the right one for your job — and at a price that's right, too! Delta is the industry's *most complete line* of metalworking and woodworking machines — and the only line with *complete, quality* accessories to make every machine more useful.

Actually, you'd expect to pay much more for the all-around *high quality* of these grinders. But at the moderate Delta price, you get typical quality features like these: Pre-loaded, lubricated-for-life ball bearings. Precision-bored bearing seats. Precision-ground spindles. Dynamic balancing of all parts that rotate at high speed. That's why you're absolutely sure of top value, when you buy Delta — know you can count on safety, accuracy, economy, and convenience that last.

So see Delta *first*, when you need grinders — and any other metalworking or woodworking machines. Send coupon below for facts on every machine in the entire Delta line.

POWER TOOL DIVISION



Rockwell

Manufacturing Company

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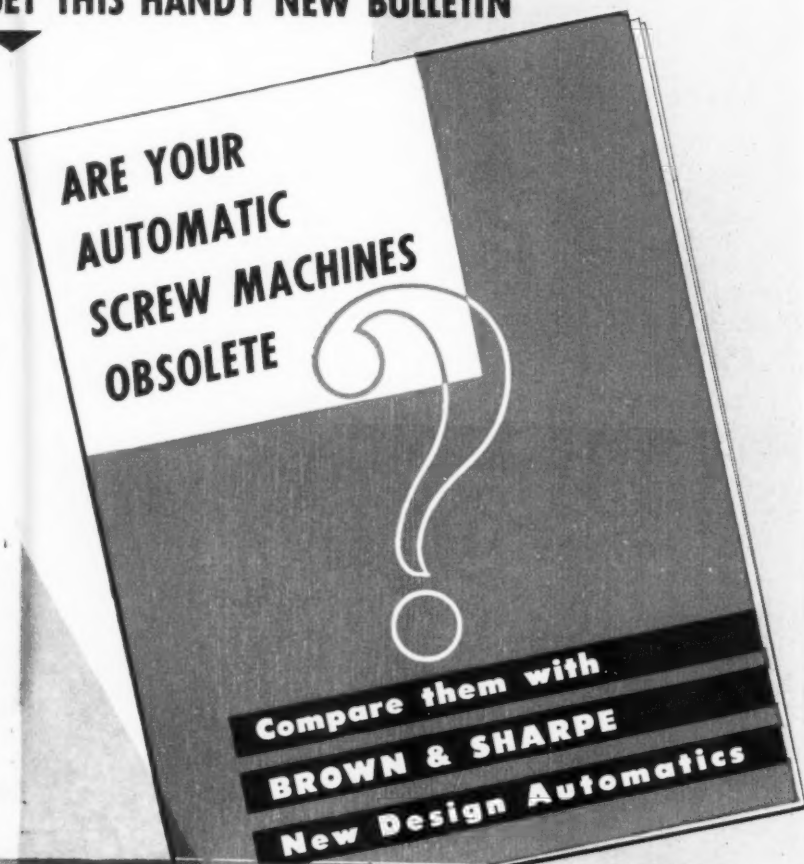
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See why today's **AUTOMATICS**
are much more productive
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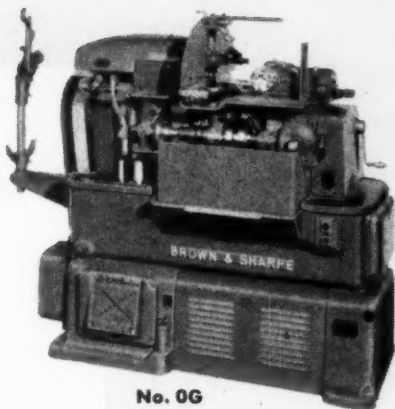


BROWN &

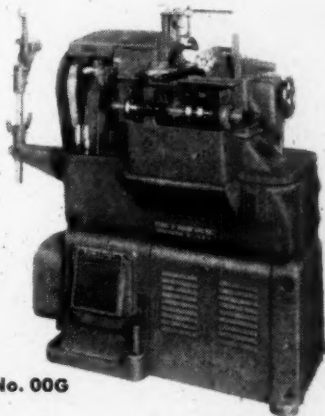
Maximum production per hour from every machine tool in your plant is more essential than ever, as today's conditions become increasingly competitive.

The new Brown & Sharpe Bulletin at the left shows how you can gain by replacing older automatic screw machines with those that embody the very latest features in design and construction. Features of today's Brown & Sharpe models and previous models, in chart form, make comparisons easy . . . fast . . . positive.

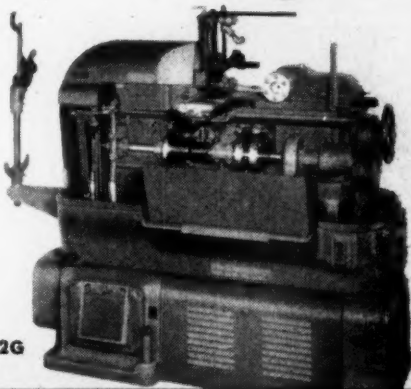
Send for your copy of this handy, helpful bulletin and guide, "Are Your Automatic Screw Machines Obsolete?" It covers the facts that you would ordinarily collect and correlate before making an investment. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.



No. 0G



No. 00G



No. 2G

SHARPE



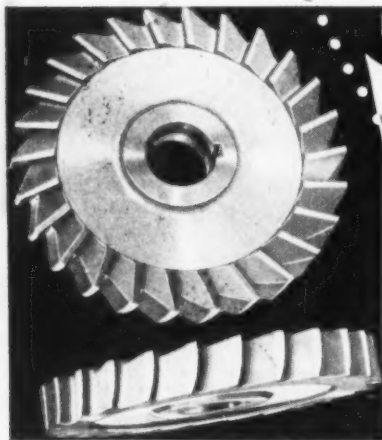
150 to 425

YES... in a recent comparative performance test, 150 Aber "Curved Tooth" milling cutters out-performed 425 conventional type milling cutters — a $2\frac{1}{2}$ to 1 increase at NO EXTRA COST!

Designed and developed specifically for production men who look to NEW tool designs to reduce top-heavy metal cutting costs, Aber "Curved Tooth" milling cutters operate at speeds 10% to 25% faster than standard straight tooth milling cutters in addition to providing smoother finishes and



close to tolerance operations. Utilizing the most outstanding tooth design developed in the past decade, Aber Engineering Company produces a complete line of quality milling cutters featuring the "Curved Tooth" principle.



A TYPICAL ABER "CURVED TOOTH" PERFORMANCE
OPERATION: Milling lugs on plate. Slotting and side milling parallel sides.

MACHINE: Cincinnati 3-Spindle Mill.

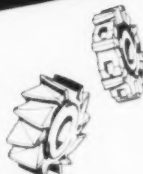
TOOL SETUP: (1) R. H. and L. H. Shear Side Milling Cutter.
 (1) R. H. Half Side Milling Cutter.
 (1) L. H. Half Side Milling Cutter.

Feed: 10-1/2"

PERFORMANCE: 16-1/2 hours between grinds. Best previous practice with conventional, straight tooth H. S. S. milling cutters was 6-1/2 hours between grinds.

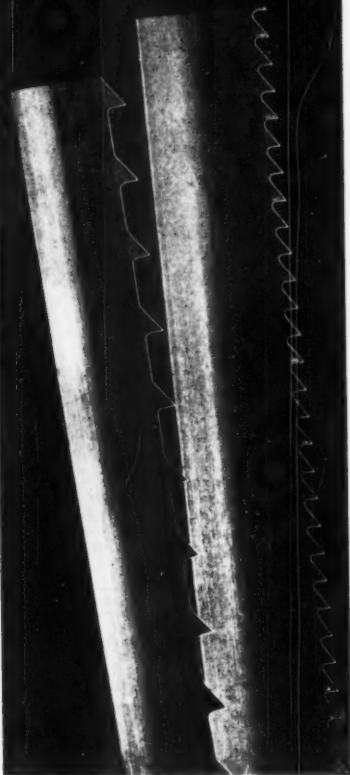
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When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

53

FROM

25-125

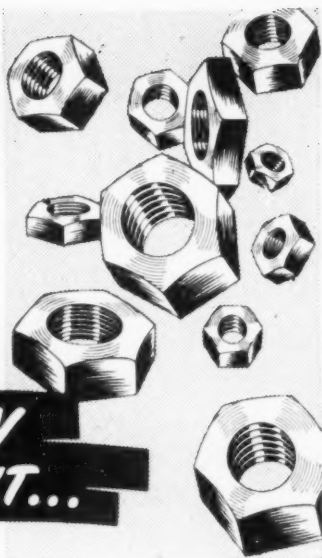
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per tap**

TO

22,000

**clean class 3 threaded
holes per tap**

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PART: 18-8 stainless steel hex nut with *punched hole*

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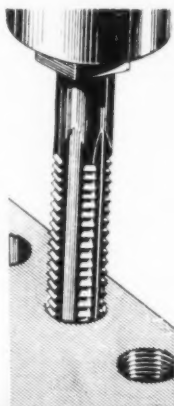
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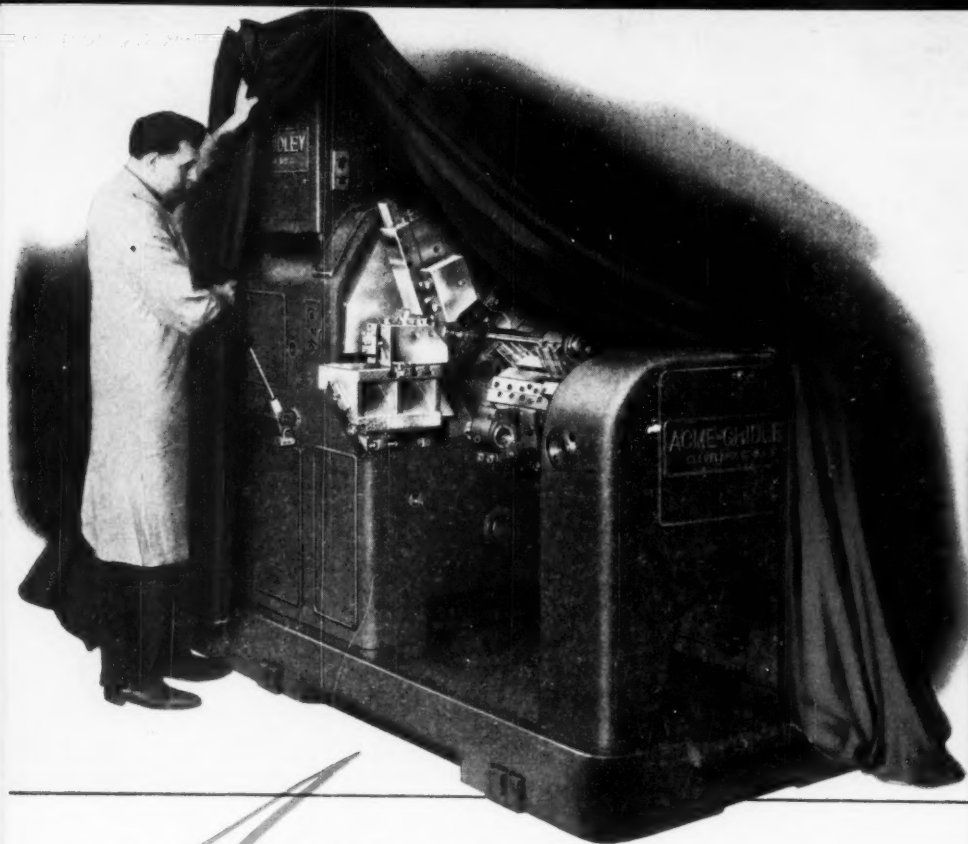
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THE FASTEST... MOST ECONOMICAL

SINGLE SPINDLE BAR AUTOMATIC

IN SIZES 2 $\frac{5}{8}$ ", 3 $\frac{1}{2}$ ", 4 $\frac{3}{4}$ " AND 5 $\frac{1}{8}$ "

For details turn page 

• Cam-controlled clutches automatically provide 3 spindle speed ranges with each combination of change gears. Speed and feed change gears interchangeable over wide range.

• 25 HP motor and unit control box conforming to JIC specs.

• 3 heavy cross slides of time-proved Acme-Gridley design—each slide operated independently.

• 3 independently cammed end-working slides on 5-sided turret.

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• Wide, open tooling area with plenty of chip room—chip conveyor optional.

• Rugged outer turret support houses Geneva mechanism with separate motor for indexing turret independently of cross slide operation.

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offers...

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- ★ **ACCURACY** — Sustained close tolerances and fine finish at the fastest feeds and highest spindle speeds, modern tools can take.

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THE NATIONAL ACME CO.
170 EAST 131 STREET - CLEVELAND 8, OHIO



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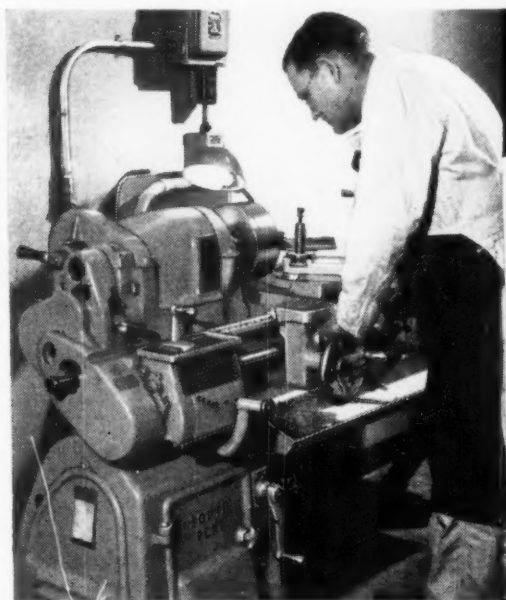


Photo courtesy of Trans World Airlines

USE SOUTH BEND

Close tolerances come without a "fight" on a South Bend Lathe. Regardless of the operation you'll find that you can get exact dimensions every time without slowing up. It's another example of "quality counts". You can always depend on a South Bend to turn out better work. It's built right — it's accurate, versatile and easy to operate. In the long run, it will actually cost you less for you get more and better service. You can't buy a "cheap" machine tool and expect to get satisfactory performance — "cheap" tools are never economical.



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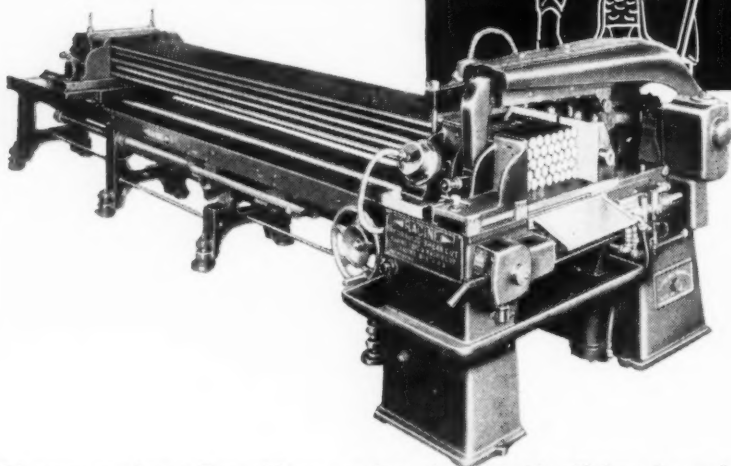
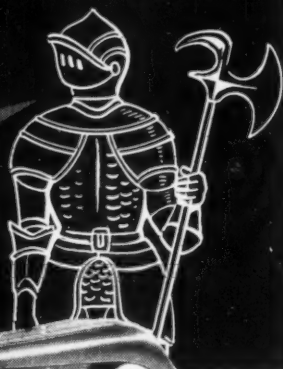
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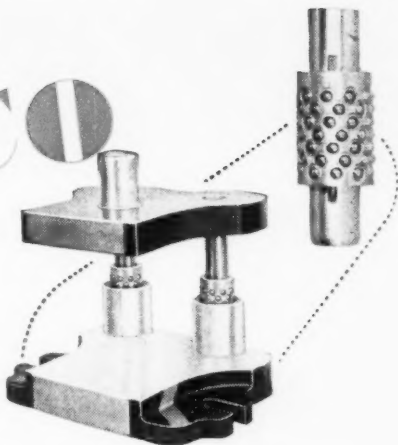
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Gentlemen:

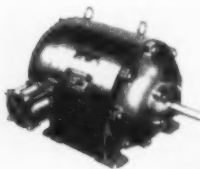
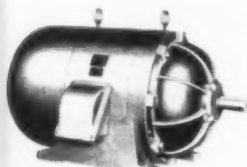
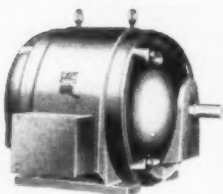
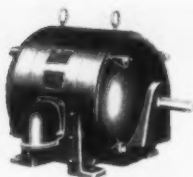
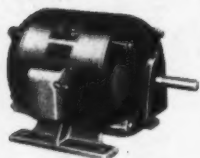
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standard die sets.

Company

Name

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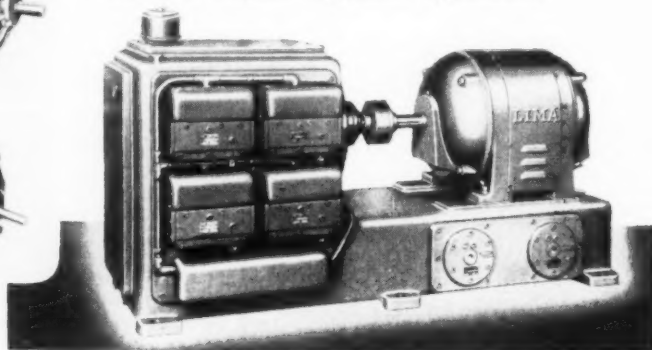
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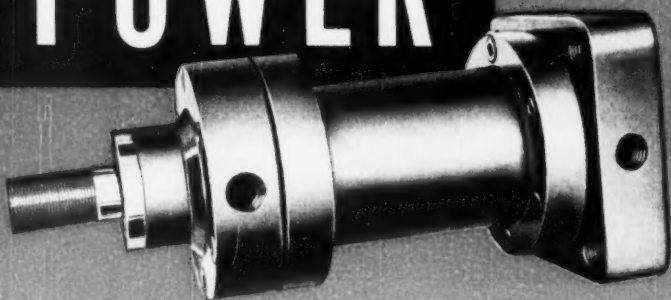
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MACHINE and TOOL BLUE BOOK

March, 1950

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Big holes! Little holes! Deep holes! How can we bore 'em better for less? This may be your problem occasionally. But boring holes at lower cost is the full time problem for Madison engineers. This specialization can save *you* money just as it is doing every day for leading manufacturers. Why not take advantage of the two big things — Madison experience and Madison tools — that can cut cost on your production boring jobs. You're welcome to put another hole in one of our engineers' heads. Ask them to consider your problem and come up with a cost lowering idea. No obligation, of course.

BETTER BORING TOOLS

Madison Cutters in Madison Bars . . . the best in boring tools. Madisons give you superior finishes, in most cases equalled only by grinding. Tolerances to .0003. Two-bladed cutter that expands to make up for wear in regrinding — also quickly changed from one size to another with no disturbance of the set-up. Cutter floats in the bar — no special floating tool holders needed. More holes per cutter before regrinding and more regrinds per cutter (about 10 times as many as similar tools) . . . and many other original Madison features of design.

MORE BORING EXPERIENCE

For 35 years Madison has concentrated on solving boring problems. With this background of experience applied to your production job, you can count on the best solution to save your money. What's more, you can count on a recommendation based on a complete line of boring tools.

Write for the information filled Madison Catalog. It is yours for the asking.



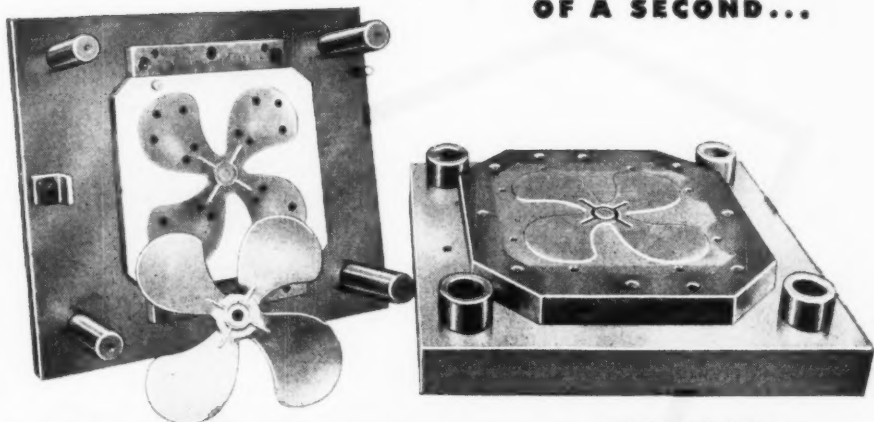
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MANUFACTURING COMPANY

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MUSKEGON, MICHIGAN

**FOUR-FIFTHS
OF A SECOND...**



AN ACCURATELY PIERCED, EMBOSS-BLANKED FAN BLADE
with a compound die and

PRODUCTO DIE SET

See our exhibit, Booth 1065, at
the A.S.T.E. Exposition, April
10-14 in Philadelphia, Pa.

Call "Producto" in classified
telephone directory in major
stamping centers. Fast service
thru 26 Producto Representatives.

This blade — used in an oscillating cooling fan — turns at 3600 R.P.M. Perfect blade balance must be maintained for quiet, efficient operation. Such an exacting demand could be met only by using the most accurate of die sets. A PRODUCTO Special Die Set handles this job very efficiently... at a production rate of 4500 blanks per hour an average of 85,000 pieces between grinds is maintained.

The job specifications indicated no burrs would be allowed while maintaining a tolerance of $\pm .001''$ in producing this 10" diameter fan blade. The strip stock used, H.C.R. Steel, 1/32" thick in 12 ft. lengths, assures perfectly flat blanks, (a final operation adds the necessary blade pitch).

The 18" x 14", four pin, Special PRODUCTO Die Set (above) is one of many approved wholeheartedly by our customers. For your next die set buy PRODUCTO and experience the satisfaction of seeing a tough job well done.

THE PRODUCTO MACHINE COMPANY
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All Standard Accessories Ready to Go Immediately

DETROIT DIE SET CORPORATION immediately on receipt of order ships all standard items in a wide range of sizes . . . dowel pins, die springs, stripper bolts, socket grip head cap screws and other accessories. All are nationally known products manufactured with the same precision as "DETROIT" die sets. For dependable shipment, 'phone, wire or write "DETROIT."

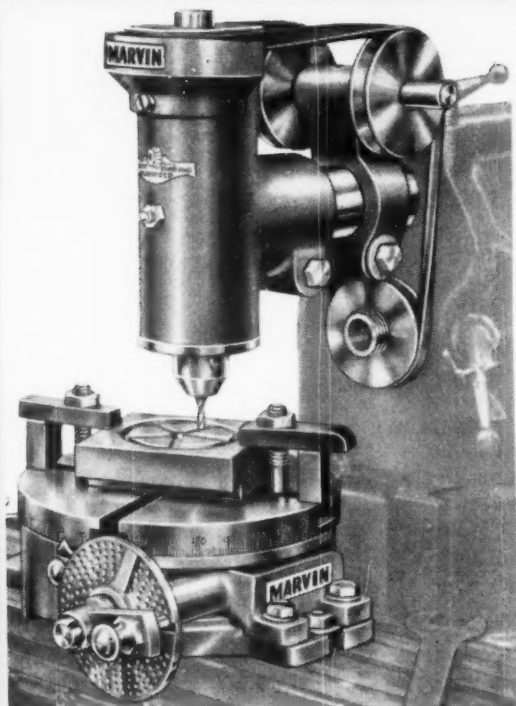
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DIE SET ★**



Marvin MACHINE TOOL ATTACHMENTS *"Precision Engineered"*

Marvin attachments are precision engineered by tool men of long tool room experience, designers who know precisely the exacting demands of modern industry. This knowledge is reflected in the versatility and operation of Marvin Machine tool attachments. They are paying off in lower costs and higher quality work.

(Illustrated Above)

MARVIN VERTICAL MILL ATTACHMENT. No. V-1200, a Head combining simplicity and high performance with low cost. This Marvin Head can be set at angles, pulled out far past the travel of the table for large overhanging work. Simple to attach. Has a heavy spindle equipped with Timken tapered roller bearings which assures smooth operation at high speeds. Spindle nose takes end mills with $\frac{3}{8}$ " straight shank, up to $\frac{1}{2}$ " diameter cutter. Unit is machined to slip over $1\frac{1}{2}$ " overarm. Easily adapted to other size overarms. Height $7\frac{1}{2}$ ". Price \$65.00.

You are cordially invited to inspect Marvin Machine tool attachments in operation at Booth No. 1010, A.S.T.E. Industrial Exposition at Philadelphia, April 10-14, 1950.

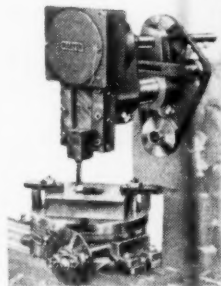
MARVIN ROTARY INDEX TABLE. No. 7-1102. A strong rigid precision table at a moderate price.

The 6" table is graduated in degrees and has T slots for $\frac{3}{8}$ " bolts, with a bushing in the center. Table locks from the bottom. It cannot tilt. Cast iron worm wheel, hardened and ground worm (40:1 ratio). Worm can be disengaged. 3 index plates with 6 sets of holes each give a wide range of divisions. Hand wheel also furnished, graduated in $\frac{1}{2}$ degrees. Height $25\frac{3}{8}$ " . . . which gives ample working space. Price \$93.00.

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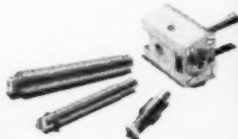
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MARVIN DIVIDING HEAD. No. B-1400



MARVIN MICROMETER BORING HEAD. No. M-1000T

Lower cost Jig Grinding

proved by Vulcanaire for over **3** years

HOW? You place the Vulcanaire quickly in the spindle of your jig borer or mill.

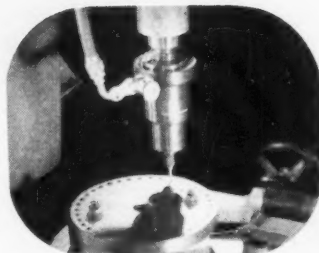
NOW! You can locate—finish grind holes in hardened steel to "tenths" at controlled speeds up to 65,000 R.P.M.... grind dowel holes—square with a ground base... move location of holes in hardened steel blocks... grind interchangeable holes in hardened sections... grind .032 to $\frac{1}{8}$ " holes with diamond impregnated laps... grind contours and relief with tungsten carbide burrs... grind radii in die sections... grind contours in gages... jig grind large and awkwardly shaped components... eliminate jig bushings in tools where close spacing is essential.

PRECISION! Jig ground requirements are being designed into tools by the most enlightened engineering departments... Jig ground the hardened die, stripper plate, and die holder all fit together... uniform clearance means longer runs.

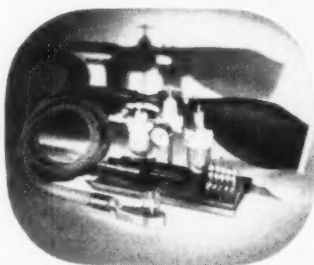
ADVANTAGES! The investment is less than for many Jig Boring accessories such as a rotary table... the Vulcanaire can be put on and taken from the machine in a few seconds... the Vulcanaire is completely portable (all accessories are platform mounted)... the system can be used between several machines of various capacities... employing both the 10,000 and 20,000 series, components with various sized holes from the very smallest to 4" in diameter can be Jig Ground... the average Jig Borer operator becomes proficient at Jig Grinding after very little experience.

TOPS IN PRECISION!... the Vulcanaire is precision built throughout and is constructed of alloy and tool steel. Super precision bearings, preloaded with our special fixtures are used, with all traces of radial and end clearances removed, resulting in Vulcanaire Jig Grinding to "tenths".

*For quotation and literature please
mention machine tool application.*



FOR JIG BORERS OR MILLS



COMPLETE SYSTEM INCLUDES
DUST ELIMINATION

Vulcanaire

BUILT BY TOOLMAKERS

FOR TOOLMAKERS

HIGHLAND AND LORAIN AVENUES
DAYTON, OHIO

Vulcan Tool Company

Featured in ... this issue ...

How's Business. A section devoted to an analysis of current business trends and activities. Page70

How Sterling Motors Increased Production Through Efficient Materials Handling, by Ernest O. Danielson. How should materials handling problems be analyzed? If new equipment is to be bought, on what basis should decisions be made regarding the type of equipment to be purchased? The Sterling Motors people had a definite production and materials handling problem. Their method of approach and their solution and the final result achieved is discussed in this article by Mr. Danielson. Page77

The Use and Applications of Single-and-Multi-Spindle Automatics, Ralph A. Warren. In this, the third of Mr. Warren's series of articles on screw machines, the single spindle type is concluded. Beginning next month the multi-spindle machines will be analyzed and hints on their operation, and methods of getting more work out of them, will be discussed. Page91

Professor Reichardt's Quizzes. Pages92-118

How to Effect 10%, 25% Or 50 %Economics In Your Machining Operations, by H. A. Frommelt. This is the second section of Part 1 which deals with methods of achieving 10%

economics on your machining operations. In coming installments the methods to be employed in obtaining 25 or 50% economies will be discussed. Page103

Letter From England, by Robert Hutcheson, Editor, Machine Shop Magazine, London. Page123

Foremanship Forum: Foreman Want To Know About Business, by Edmund Mottershead. Too frequently the foremen are kept in the dark regarding their companies' standing in the over-all business picture. They want to know what's going on. They want to feel a part of the management team and be accepted as part of management. Page131

Views From Here and There. Page141

Modern Tools In Action. Page147

Available Literature. Page163

Advertisers' Literature. Page177

New Books. Page178

What's New in Metalworking. Page181

Products Index. Page280

Advertisers' Index. Page286

Unusual Tool Capacity

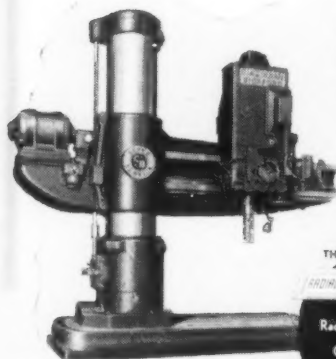
Unusual Spindle Support

What is full spindle support? What does it accomplish? It's rigid support against thrust and radial load—at ALL positions of the spindle.

In performance, it means accurate, smooth power delivery and long, trouble-free operation.

The multiple spline driven Cincinnati Bickford Super Service Spindle—with its large thrust bearing and its special sliding sleeve—never feeds away from its bearings.

This modern, up-to-date design, with 36 speeds and 18 feeds, also gives a maximum tool capacity for any given size.



Equal Efficiency of Every Unit
Makes the Balanced Machine

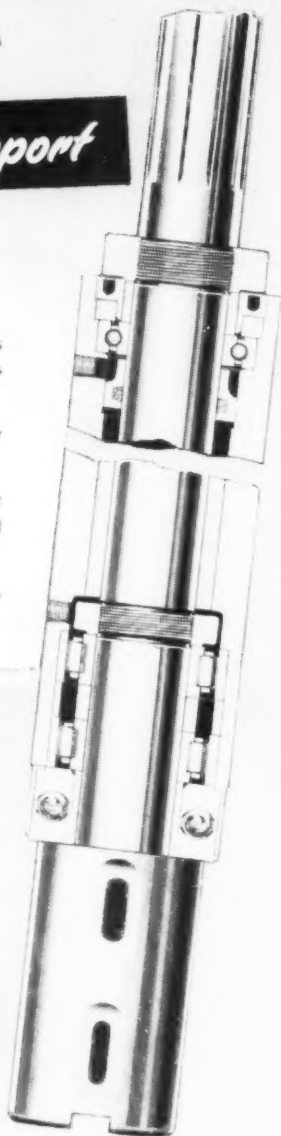
Write for Circular R-29 for details of construction of this Cincinnati Bickford Super Service Radial Drill.

This machine is furnished in sizes 11" to 19" diameter column, 3' to 8' arm.

THE CINCINNATI BICKFORD TOOL CO.



Radials 7½" dia. col., 2½' arm, to 56"
dia. col., 12' arm.
General purpose Uprights, 21" to
28" sizes.
Production Uprights, 21" to 28".
Jig Bore, Portable Horizontals,
Spacing Table Machines.



THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

As the **editor** **SEES IT**

EVERY ENGINEER CAN BE A CAESAR

All of us have a secret desire to be Caesars, if not of the battlefield or of the forum, then of the production front. We'd like to inaugurate brilliant campaigns and beguile the enemy with sly cunning. Oh, for the power to completely renovate our plants: buy new machines, change designs, reorganize production functions, and integrate all manufacturing, sales, and business activities. Oh, for the mastery over men and machines! Such would be our generalship the world would laud us and load us with fames and riches . . . if we were Caesars.

But we're not. And yet, in our small spheres, circumscribed by managerial dictates and comptrollers' purse strings, we can be Caesars. In ingenuity. In scope of imagination. In precise thought. In careful execution of details, if not in global plans. The difference between Caesar and us lies not in the kind of thought, or in the kind of imagination, but in intensity of each and the amount of each we use. We can play our imaginations on the execution of small plans and conquer production problems with the same painstaking care that Caesar conquered Gaul.

Any plan is no more than a collection of details. The concern lavished on each

and the skill with which every detail is correlated with the next composes the mosaic of the plan.

What, for instance, are the details that compose a plan for increasing production? There are many; here are a few: are machining speeds right for the job in hand? are the feeds correct? can either speeds or feeds be increased or decreased for greater production? Are the right machines being employed for given operations? Can other machines be substituted to better advantage? What of the cutting tools? Can holding devices be improved to reduce loading and unloading operations? Is there sufficient horsepower on the machine for best results?

However you may answer these questions are you sure you're right?

How do you know your answers are the best?

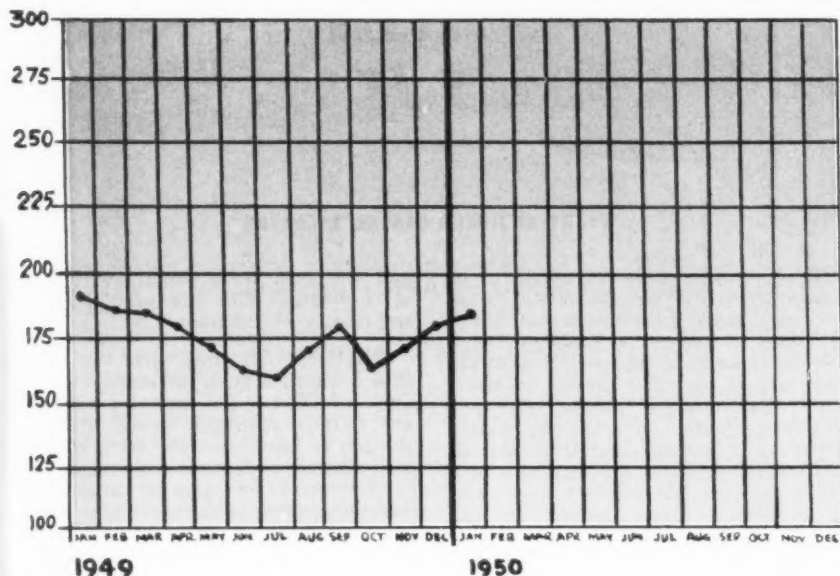
Have you examined every operation and every machine lately? critically and honestly?

You CAN increase production. You CAN effect manufacturing economies by examining every detail of the production process. No Rubicon can be crossed unless every detail is planned successfully.

William F. Schleicher

HOW'S BUSINESS ?

TOTAL INDUSTRIAL PRODUCTION INDEX FOR 1949 AND 1950



base: 1935-1939=100

source: Department of Commerce

E means estimate

"With private savings at record levels throughout the country, the private enterprise system is starving for lack of debt and equity capital," so says Senator O'Mahoney. He has introduced a bill, S. 2975, which will channel the savings of the people"

... safely and profitably into investments that will permit maintenance of present high levels of employment."

CAPITAL INVESTMENTS

The plan proposes to establish a series of banks throughout the country who would make long-term loans to small businesses. Prospective borrowers would be screened and their eligibility approved by the government.

Unfortunately, the bill makes no mention of the restrictive tax laws which now hobble capital investments, i.e. unfair depreciation laws, and double taxation of profits and dividends. The proposed bill appears to be merely another bottle of medicine without effectively digging to the root of the disease.

TOTAL CIVILIAN EMPLOYMENT DROPPED BY 1¼ MILLION between December and January, with the mid-winter lull in trade and outdoor work. Civilian employment was estimated at 57 million for the week ending January 14, as compared with 58½ million for the week ending December 10, according to latest Census Bureau figures. Unemployment rose by about 1 million between December and January to a postwar high of 4½ million. Bad weather, and seasonal industries account for the rise in unemployment.

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'955'

955 HAS CAPACITY

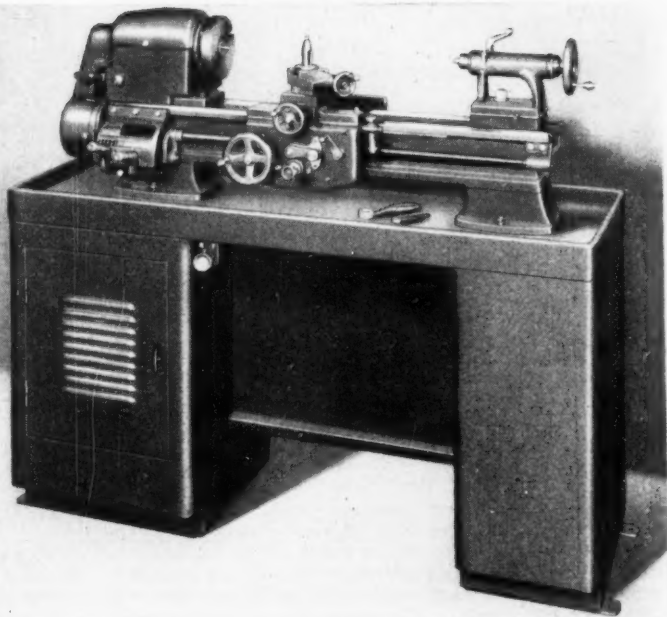
1" collet capacity, 11" swing, 1 7/8" spindle hole, 24" between centers. (36" between centers also available.)

955 IS ACCURATE

Typical tolerances: less than .0005" total run-out of spindle 12" from bearing. Bed ways precision ground to within .0005" variation.

955 IS DURABLE

Extra rugged in construction. Self lubricating bronze bearings protect vital wear points.



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The 955 has all specifications and tolerances of lathes selling at up to \$1,000. Here is a lathe with the sustained accuracy, the versatility, the speed and the ruggedness that industry expects of Logan design. Here is a lathe with the capacity to handle the majority of metal turning jobs. Here is a pedestal base with underneath drive that keeps moving parts enclosed yet accessible, saves space in multiple installations or single installations, and simplifies cleaning. Here is a saving in price that is true thrift because it entails no sacrifice in quality. Here, in brief, is the new Logan combination of quality, low price, and low-cost performance that makes the 955 the lathe to buy today. See the 955 on display at your nearby Logan Lathe Dealer's, or write for the new 955 Folder.

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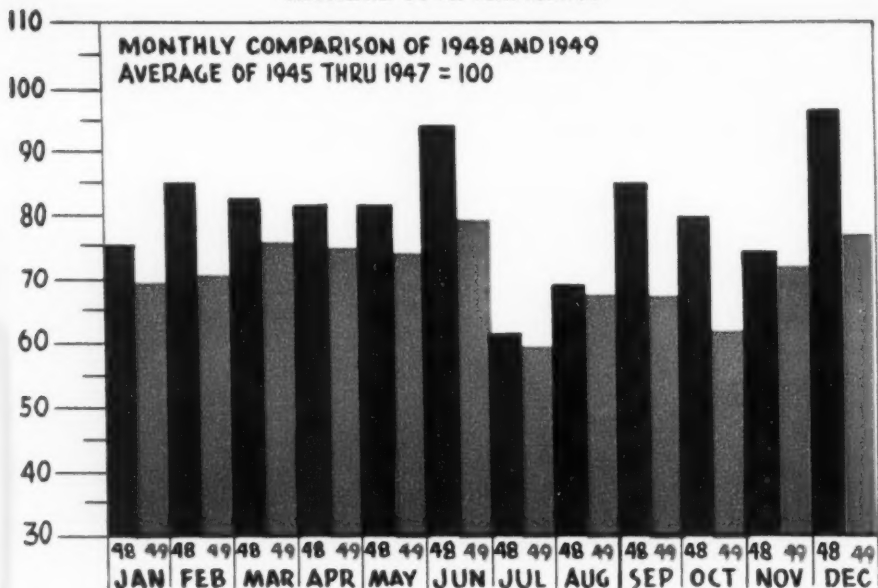
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71

MACHINE TOOL SHIPMENTS



source: National Machine Tool Builders Association

FUNDAMENTAL FACT IS THIS: more coal can be produced than the market will absorb. Peak capacity is in excess of 600 million tons a year. In 1949, with 120 working days lost through strikes, production was 400 million tons with no real shortage during 1949. The pinch is beginning to be felt only now. Lewis' idea was to spread the work among all the miners, using this as one method of controlling coal production and distributing work among all the miners. Operators want a five-day week and, it is assumed, control production through layoffs.

THE COAL SITUATION

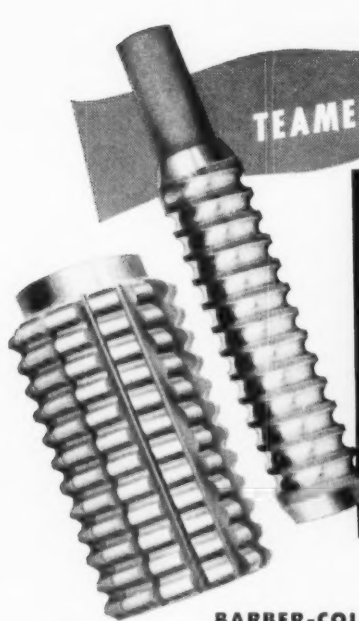
Industry believes a more fundamental solution to the ills of the coal industry is urgently necessary if they are not to be continually plagued by coal shortages. Many industrial cut-backs in production are in the offing as the result of present shortages. The coal industry has been troubled by a lack of orders from overseas. This has aggravated the production problem.

INDUSTRIAL DEVELOPMENT. A 15 million dollar industrial development is under way on a 95 acre tract near the Los Angeles International Airport. It is anticipated that room will be available for approximately 100 industrial buildings. Five plants are now being built.

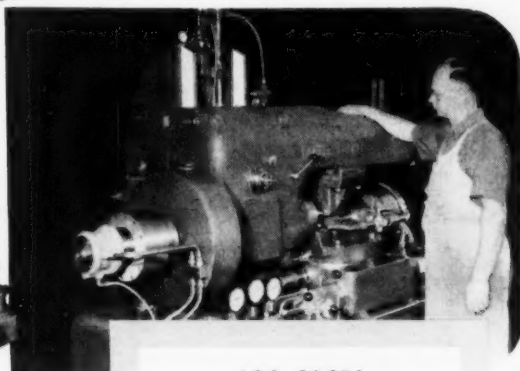
STRUCTURES AND BINS. Commodity Credit Corp. expects to buy bins and storage structures for the storing of millions of bushels of grain. Bins needed should be of steel, aluminum, combination steel and aluminum, or of wood.

PRE-STRESSING OF CONCRETE. This method may be widely used on construction projects and consequently open new markets for high strength wire. Experiments have been conducted by John A. Roebling's Sons Co., and it is expected that this form of construction may be used for highways, girders, and slabs.

HEAVY DIESEL BUYING by the New York Central has resulted in orders for 133 diesel loca-



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**BARBER-COLMAN
THREAD MILLING CUTTERS
AND No. 14-15 HOBGING MACHINE**

**MILL BALL-NUT STEERING WORMS
IN 1.6 MINUTES FLOOR-TO-FLOOR**

Engineered-for-the-job, these Barber-Colman Multiple Thread Milling Cutters are "teamed" with a Barber-Colman No. 14-15 Hobbing Machine to give faster output in worm thread milling. Results of this engineered combination are floor-to-floor time per worm of 1.6 minutes, and an average of 300 pieces per cutter sharpening. Cost per worm naturally has been greatly reduced.

PRODUCTION GUIDE
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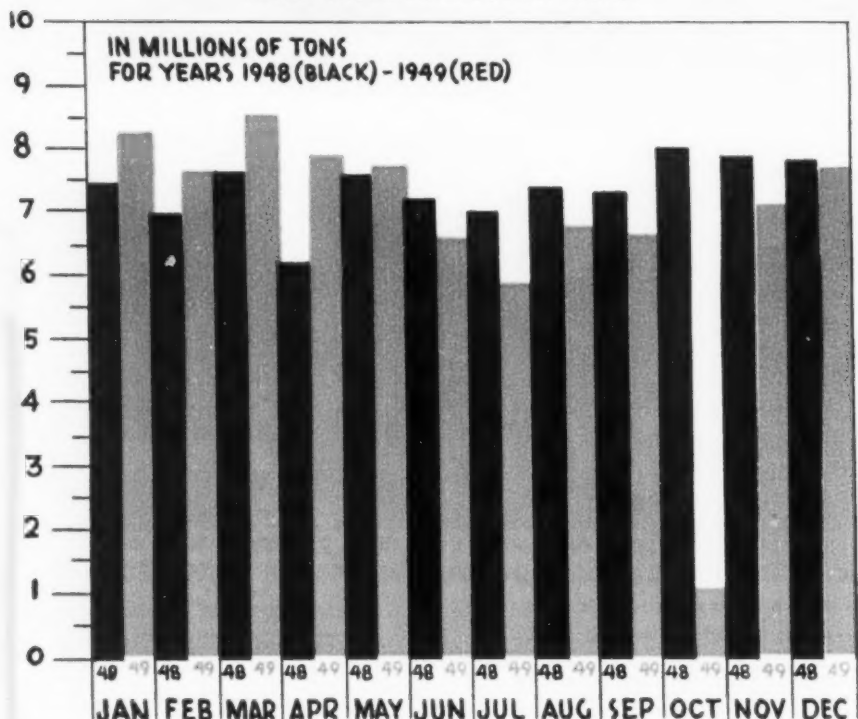
For that extra production bonus on milling operations, consult Barber-Colman engineers. Their experience with cutting tools engineered-for-the-job can save both time and money in getting the job done right.

Barber-Colman Company

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8809 Loomis Street, Rockford, Ill., U. S. A.



TOTAL STEEL PRODUCTION CHART



source: American Iron & Steel Institute

motives from GM Electro-Motive Division, American Locomotive Co., Lima-Hamilton Corp., Fairbanks-Morse & Co. Seaboard Air Line Railroad has placed orders for 36 diesels with Electro-Motive, and American Locomotive.

INVENTORIES INDICATION OF BUSINESS ACTIVITY. Generally speaking, inventories are low. Business, it is reported, had inventories amounting to 53 billion dollars at years' end, or 4 billion dollars below 1948. Manufacturers' stocks are down to 31 billion from a high of 34 billion. Efforts are under way to rebuild these inventories and many segments of industry report increases in orders.

EXPENDITURES FOR HEAVY ENGINEERING was up in January. In fact, orders ran about 50% ahead of 1949.

With personal income on the increase (spurred by veterans' insurance refunds), personal spending even with 1949, there is little reason to suppose that drastic cuts will be taken in production.

As an indication, the **MACHINE TOOL INDEX**, while showing a decline in domestic new orders for December over January, shows an increase in foreign orders. The 1950 outlook for this industry is bright.

New **diacro** **POWERSHEAR**

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**VARIABLE
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4. **"SINGLE STROKE" SHEARING**—non-repeating safety clutch for jobs not adaptable to continuous shearing.

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See Di-Acro Exhibit Booth 316— Tool Engineers' Industrial Exposition, Philadelphia, Pa., April 10-14.

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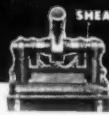
Manufacturers of DI-ACRO



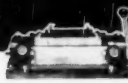
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HOW STERLING MOTORS INCREASED PRODUCTION

Through Efficient Materials Handling

by Ernest O. Danielson, Factory Manager,
Sterling Electric Motors, Inc.

How do you analyze your materials handling needs? What steps must be taken to reorganize the flow of production? Sterling Motors gained valuable floor space, reduced their production costs, reassigned manpower to other operations through an efficient materials handling system. Their reasoning regarding their problem and their methods in executing their ideas are well described by the author.

INCREASED SALES of our products, supplemented by an extensive market survey, conclusively indicated the necessity of a large increase in the productive capacity of our plant, Sterling Electric Motors, Inc., Los Angeles, Calif. Merely adding floor space within the restricted limits of our factory site was not either feasible or adequate.

Our manufacturing problem is to provide a large, continuous production of specialized electric power drives for national distribution, the variable speed, "Speed Trol"; totally enclosed, "Klosd-Tite"; "Slo-Speed"; normal speed, "Klosd"; horse power ranges from $\frac{1}{2}$ to 15, to comprise the four major lines; supplemented by splash-proof, pipe ventilated, and other types for specialized applications.

After detailed studies, I outlined the following general pattern of reasoning and analysis as a major guiding factor in the complete revamping of our production system. A large portion of the payroll of American industry is spent in feeding materials to productive work stations, moving it from one operation to another, or, most expensive of all, playing "Put and Take" with storage banks. The cost of handling materials behind the production line is often greater than the cost of manufacturing.

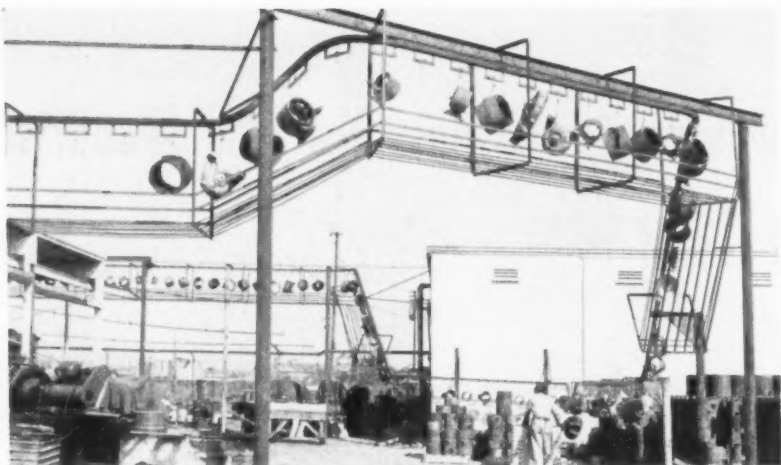


Fig. 1. Rough stock conveyor loaded in the casting storage yard.

"Conveyorizing", the scientific handling of materials by mechanical means, is a must if maximum output at minimum cost is to be realized. Through installation of complete and efficient materials-handling equipment as much as one-third of the wage dollar, spent solely on the manual movement of material in the average factory, can be saved and reinvested in productive labor by upgrading and reassigning personnel, thus making every worker's efforts contribute directly to the value added to the product by processing.

The first step in conveyorizing is a thorough and scientific analysis of production flow, and an exacting time-study of all operations involved, from the raw materials, through the finished to the shipped product. Existing lines may be changed with departments relocated, but a good production engineer, working with a competent materials handling engineer, can design plant layout changes to adapt the production cycle to modern, mechanized, materials-handling methods.

The engineers must make a careful

Fig. 2. Dipped castings on rough stock conveyor enroute to grinding on heavy duty Gardner horizontal disc grinder.



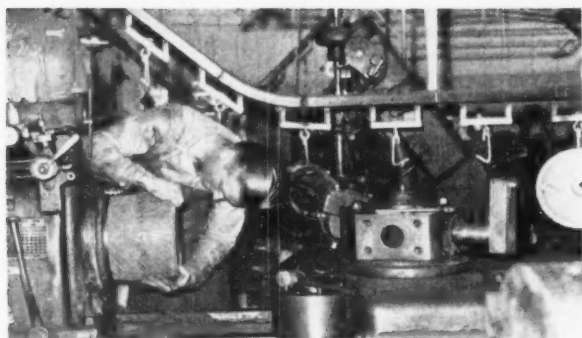


Fig. 3. Castings are carried to this turning operation by overhead conveyor; then by gravity roller conveyor to subsequent milling and drilling jobs.

study of the problems involved, such as available floor space, physical construction of the plant, types of work to be conveyed, etc., and select the best methods of mechanical handling of materials through the production cycle. This entails the judicious application of fork lift trucks and palletized containers, overhead power chain conveyors, gravity conveyors, belt conveyors, monorail conveyors with traveling electric hoists, bridge cranes, jib cranes, and all of the other types of such equipment to meet the specific demands of each production phase.

The next step is to gear the conveyor system to the movement of component parts, sub-assemblies, assemblies and finished products, through the entire manufacturing process. Thus a

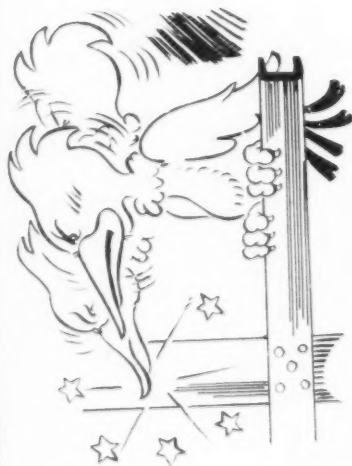
steady flow of work is fed to each productive operator at the point the next operation is to be performed, without the necessity for manual handling; accomplished through the analysis of accurate time and motion studies. From these studies the exact best speed at which each segment of the conveyor system must operate for maximum efficiency, can be determined. It may involve minor shifts in manpower to eliminate bottle-necks, and insure the smooth progression of components. Here is where exact timing, exact speeds, must be maintained if the system is to pay maximum dividends.

Now let's see what we did about it. The most prominent materials handling installations were five, Richards-Wilcox, zig zag, overhead power conveyors. The

Fig. 4. Component parts of motors delivered to assembly on overhead conveyor.



TAPPING TECHNIQUES No. 5



The woodpecker sits on a telephone pole
And tries very hard to tap out a hole.



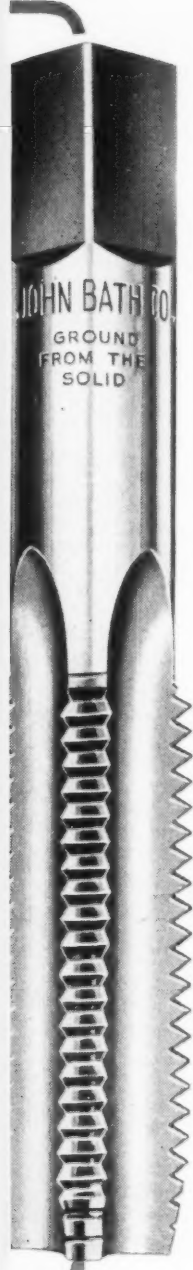
Too bad he persists — his beak's much too dull,
For the pole is of steel — and he'll fracture his skull!



Some folks (like Woody) do not use their brain.



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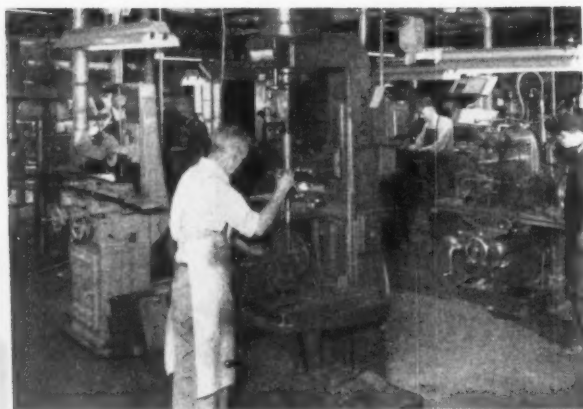


Fig. 5. Corner of tool room where precision type, high production dies, jigs, fixtures, tools and gauges are made and maintained to assure accurate machining for interchangeability of Sterling parts. Setups are delivered to machines by overhead conveyors, and also returned.

940' rough stock conveyor; 580' for assembly; 300' stator treating; 150' stator winding; and 100' coil winding. Many gravity, roller conveyors move work-in-process from one station to another; belt conveyors carry scrap away from presses blanking and notching rotor and stator laminations. Also used are monorail conveyors with hoists, bridge and jib cranes, fork lift trucks (2-ton Towmotors), dollies, and other wheel-equipped floor units.

From the supplying foundry, castings for bases, frames, end bells, etc., in steel tote boxes, are trucked in, as many as 12 boxes weighing ten tons, to the load. In the casting yard the ten tons can be unloaded and stacked four high, by the fork truck, in ten minutes. This enables storing 100 to 150 tons of

castings in a very small area.

As called for by work orders, castings are trucked to the nearby, rough stock conveyor and loaded thereon, figure 1. Copper wire coils are also carried to points of use and storage. The castings are automatically dipped in a primer paint at a conveyor dip section, then after 75' drying travel, move along a gangway between buildings, for service to and from a large Gardner disc grinder and the heat treat oven, figure 2.

This conveyor runs on into the casting machine shop, passing every prime operation to deliver castings for turning, drilling, milling and other machine operations, figure 3. Gravity roller conveyors also carry work from one operation to another in this department,

Fig. 6. Motor shafts cut to length, enroute from cut-off saw to machining operations.





Fig. 7. Shaft machining and grinding section. The gang cut shafts enter the room in far background on roller conveyor and are carried on other gravity conveyors to centering, grinding, turning and "rise/fall" keyway milling machines.

and then to the overhead conveyor that feeds to the final assembly operations, figure 4.

In the tool room, tool set-ups are loaded on this rough stock conveyor for delivery to the machine shops, and then returned by the same carrier, figure 5.

Bar stock for shafts, delivered in semi-trailers, is backed down a concrete ramp next to the unloading dock and unloaded with an electric hoist traveling on a bridge crane, with the aid of a grab hook or cable sling. The stock is piled between bar uprights set loose in the concrete floor in properly spaced holes. Links keep the bars from spreading.

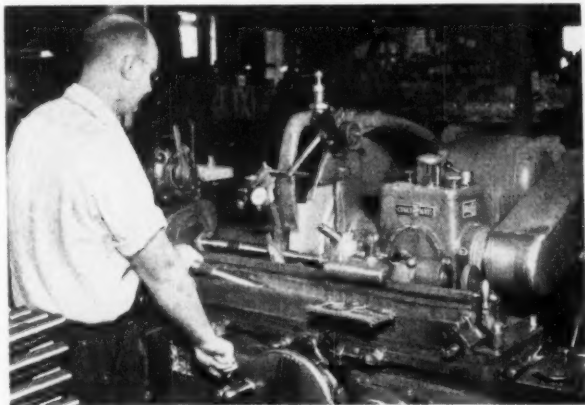
After being cut on automatic cut-off saws, the motor shaft lengths are carried on into the machine shop, in stacked, steel wire baskets, on a roller conveyor, figure 6. Transferred to other roller conveyors, the shafts are carried

in the wire baskets to all machining operations, such as centering and turning on Foster, Warner-Swasey and other lathes; grinding on Norton and Cincinnati grinding machines; and to the "rise and fall", keyway milling machines, figure 7.

Many of these machines have ingenious, Sterling-designed, accessory equipment to provide automatic operations, greatly increasing production, figure 8. Gear blanks are similarly handled to and from the helical gear cutting and gang hobbing machines and other operations.

Sheet steel, principally 28 gauge, is unloaded from railroad cars directly into the electric sheet storage, located next to batteries of high speed, blanking and notching presses where rotor and stator discs are cut and stacked. A 24" wide belt carries scrap away from three large presses to dump it in the

Fig. 8. Precision finish grinding on latest type hydraulically operated plunge type grinder. Diameter check gauge readable in tenths of thousandths of an inch, while machine is operating in continuous production. This is one of a battery of grinding machines with contour formed wheel.



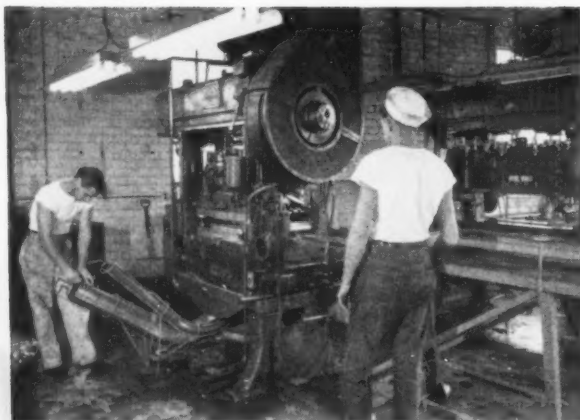


Fig. 9. Two Bliss presses at high speed, automatically cut out rotor and stator laminations from steel coil feeds. The sequence of the five stage continuous operation is: 1) cut center, bore hole; 2) notch stator; 3) blank rotor; 4) notch rotor; 5) blank stator — then stacking them for easy removal.

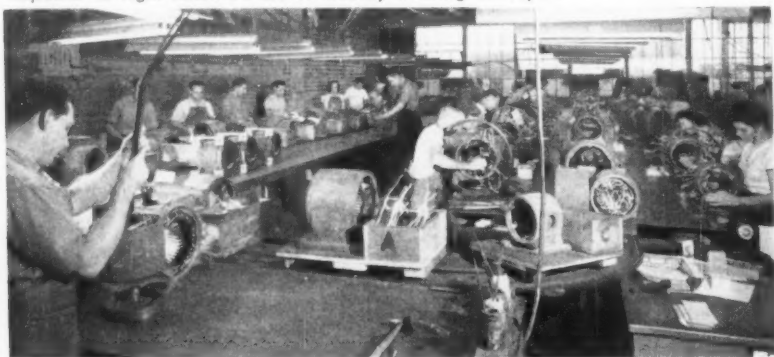
scrap yard. A 10" scrap belt serves four press combinations further on, running underneath the larger belt enroute to dumping.

In another location, two large Bliss presses, at high speed, automatically cut out rotor and stator laminations from steel coil feeds, figure 9. The sequence of the five stage, continuous operation is—(1) cut center bore hole, (2) notch stator, (3) blank rotor, (4) notch rotor, and (5) blank stator, then stacking them for easy removal. Stacked rotor and stator blanks are delivered by the rough stock conveyor to the next processings. They are formed into rigid

assemblies in high pressure, hydraulic presses, with rotor lamination assemblies going to the high pressure aluminum die casting machine. Here the rigid casting of squirrel cage and rings is thoroughly and permanently anchored to the steel rotor core. The stator core assemblies are welded on the special machine using the unique Sterling-Tungsten-Argon process of multiple arc welding.

The rotors are checked for dynamic balance on an electronic balancing machine, and then on a special rotor conditioning machine, are prepared for final assembly to which they are carried

Fig. 10. Stator winding department showing inverted zig zag conveyor moving wheeled pallets (carrying stator and box of component parts) from one assembly station to another. Stators come into the department on gravity conveyor in background. Coils delivered by overhead conveyor at right. After inspection, inspector at right loads stators on nearby treating conveyor.





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Fig. 11. Multiple coil winding machines with rapid action "fall away" coil forms. Overhead coil conveyors distribute coils to winders.

on another zig zag conveyor.

From welding, the stators ride a gravity conveyor to the stator winding conveyor, a zig zag unit mounted in inverted position in the center of the steel tables, figure 10. This pulls dollies carrying stators, coils and other supplies, from one operation to another.

Another overhead conveyor serves the adjacent coil winding department with its high speed, multiple group and coil winding machines, figure 11.

After giving his O.K. to each stator, the inspector loads it on the 300' stator treating conveyor which carries it on a dip section, into a complete saturation, varnish dip; then for a three-pass, 90' travel, 300' baking in the stator

treating oven.

From the oven, the stator cartridge starts a long travel alongside the stockroom, figure 12., through a sealer dip, to the station where it is removed to be pressed into its machined, cast iron frame which has been delivered on a roller conveyor. The whole unit is then hung on the overhead, final assembly conveyor.

Besides traveling to all parts of the final assembly department, this 580' conveyor runs through the stockroom to deliver all surplus parts from the machine shop, for storage, also picking up parts for delivery to assembly.

Quite a variety of handling units are

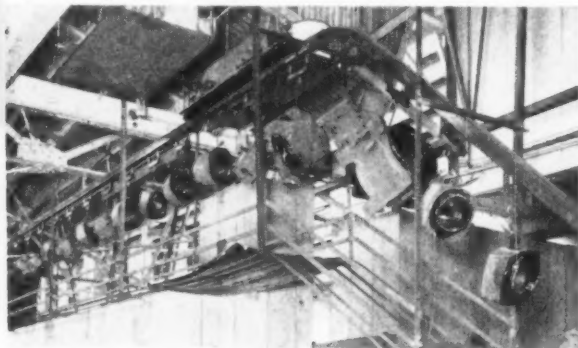


Fig. 12. Stator cartridges come from oven at right and move to sealing dip section at left enroute to assembly.

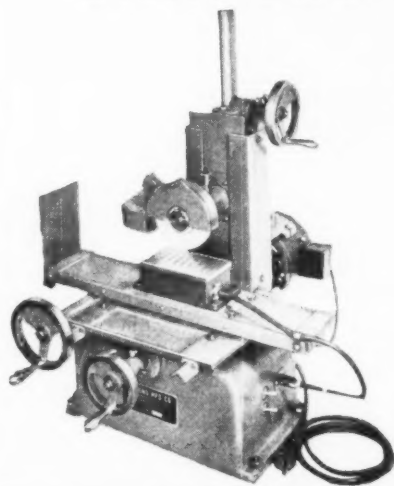
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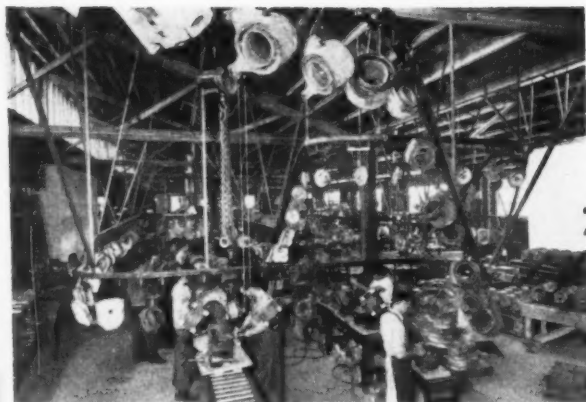


Fig. 13. Final assembly showing conveyor delivering parts to all sections of department; also parts bins at left; and gravity assembly conveyors, pallets and wheeled table at right.

Fig. 14. Power drives on final assembly gravity conveyor moving through primer and finish paint spray booths (right to left).

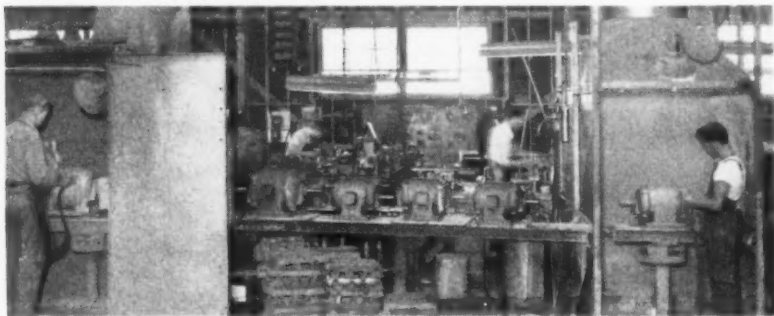


Fig. 15. After painting and final inspection, packing and shipping Sterling power drive units.



used in the final assembly. The long overhead conveyor winds around all over the area, delivering sub-assemblies and parts to strategic points, or keeping them in a large capacity, moving storage until required; also returning extra parts for storage, figure 13. Lift truck pallets and wheeled benches are used for interim, assembly storage. Progressive assembly operations take place on gravity conveyors. Included are preliminary dress-ups where all casting bumps are ground off; application of priming and finish coats of paints in successive spray booths, figure 14, and thorough inspection and testing.

Lastly, the Sterling electric power drives are packed in wirebound boxes in the shipping department, moving on roller conveyors, supplemented by an electric hoist-monorail combination above the line, figure 15. THE END.



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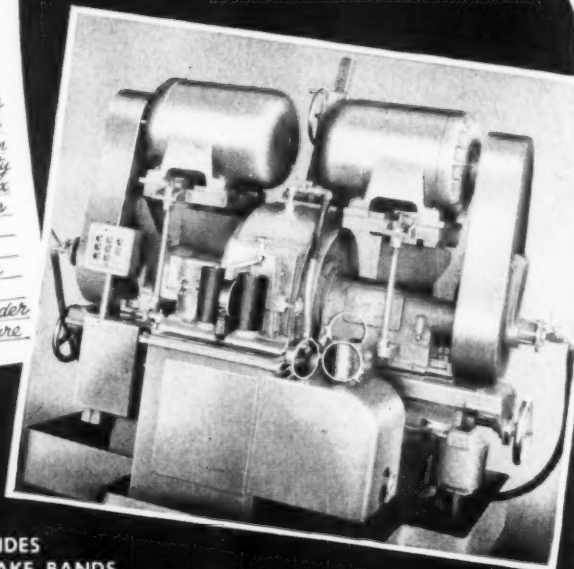
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THE USE AND APPLICATIONS OF

Single-and Multi-Spindle Automatics

by Ralph A. Warren*
Consulting Engineer

This is the third in Mr. Warren's current series of articles. Previous articles have appeared in the January, February issues of *Machine and Tool Blue Book*. With the current instalment the subject of single spindle automatics will be concluded. Beginning with the April issue the multi-spindle machines will be analyzed. Many readers who have wanted additional information have written in asking for Mr. Warren's address. For the benefit of readers who may want to contact him, Ralph A. Warren may be reached at 539 No. Homan Ave., Chicago 24, Ill.

IT WAS partially explained in preceding articles that throughout a cycle of operations, certain mechanical movements would take place within a given length of running time. Two of them are: feeding of stock, and indexing of turret. In this respect single and multiple spindle machines are alike, differing only in the mechanical methods used to put such action into motion.

On the Brown & Sharpe machines trip dogs are positioned around a carrier in direct relation to a planned order of operations. When a dog passes under a trip lever the rear end of lever engages with a back shaft clutch, thereby setting in motion the mechanical elements that control opening of collet, feeding of stock, and closing of collet. Immediately following these movements another dog passes under another trip lever and the rear end of lever engages with another back shaft clutch, setting in motion the indexing of turret.

The running time required for these mechanical parts to complete their movements is known as "Predetermined Time".

In many cases the feedout and indexing revolutions written into the estimated sheet are rather misleading, they don't always represent those that take place during the predetermined running time. The beginner

* Author of Warren's Book on Automatic Screw Machine Engineering.

wonders why at some points of the cam circumference 24 revolutions are sufficient, while at other points 40 or 50 revolutions may be used for what appears like the same movement.

It's a well known fact, a skilled operator is one who is thoroughly familiar with the machine itself; this is especially true with any type of automatic screw machine. Probably the quickest way to gain a clear understanding of the machine elements that control various movements would be, start at the beginning and follow through, see figures 1-2-3-4-5-7.

Fig. 1 represents a No. 2 machine. We draw an imaginary line Z and divide the figure into two sections, top and bottom. The top section shows the spindle assembly, swing stop, front cross slide, turret and turret slide.

Fig. 2 shows a cross section view of the top section. The spindle assembly is cut lengthwise through the middle, thereby presenting a clear view of the inner working parts. They are identified by letters and numerals.

- A Spindle
- B Spindle driving pulley

- B-1 Spindle driving pulley
- C Chuck nut
- D Chuck or Collet
- E-3 Chuck sleeve
- F Chuck levers (2)
- G Knurled nut for adjusting collet tension
- H Sliding sleeve for closing collet
- I Feed tube
- J Feed finger
- K Feed latch
- L Spindle pulley clutch ring
- M Double end clutch levers (2)
- N Turret
- O Turret slide
- P Front cross slide
- P-1 Rear cross slide (not shown this view).

Arrows O-1 and O-2 represent forward and backward turret slide travel.

Fig. 3 represents a cross section view of the bottom section of figure 1. This view is seen when looking down in direction of arrow Y, figure 1. In this section is located the mechanism that makes the Brown & Sharpe machine automatic.

The following letters and numerals

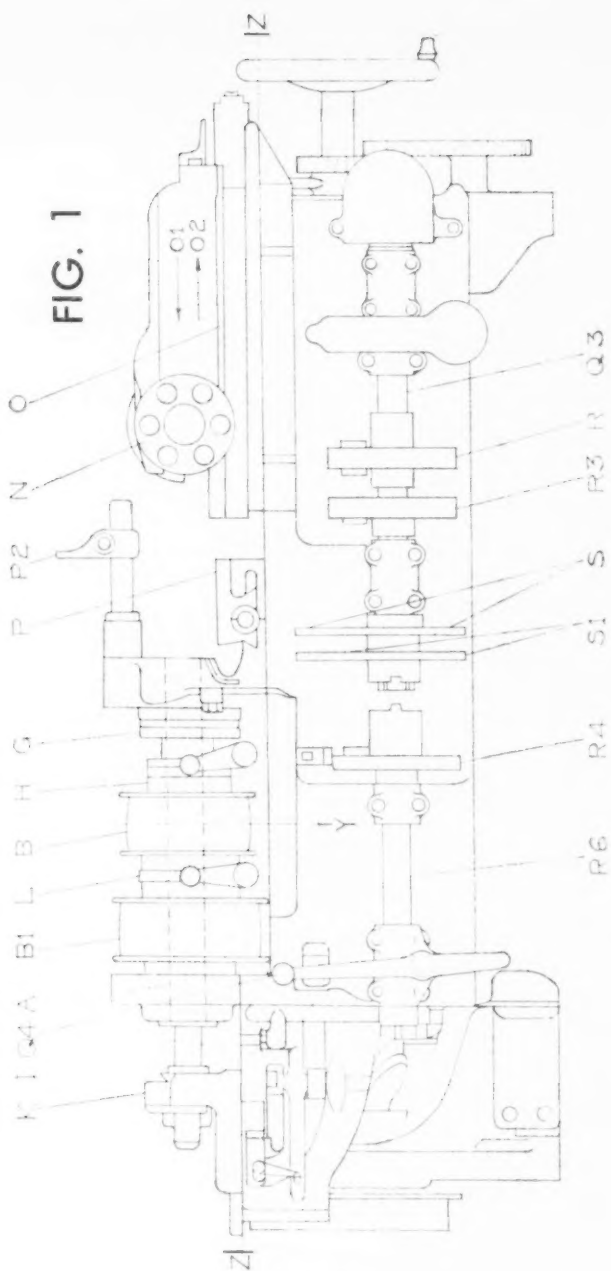
WHAT DO YOU KNOW ABOUT STANDARDS?

By Professor Herman Reichardt

Here are ten questions, mostly on standards and measurements. Give yourself ten for each right answer. Above 80 is very good; above 70 is fair; 60 or below calls for a trip to the crib.

1. A snap gauge is employed to determine the: _____
Curve; Internal Size; Surface Finish; External Dimension.
2. Maximum accuracy in gauging is secured with temperatures close to: _____
35; 50; 65; 80 degrees F.
3. Length of oval head screw includes length of: _____
Thread Only; Top of Oval; Extreme of Conical Form.
4. The shape of the bottom of an American standard screw thread is: _____
V-shaped; Flat; Curved.
5. Ball points upon a micrometer are used for measuring: _____
Depth; Screw Threads; Taper.
6. An eight inch inverted milling cutter requires: _____
8; 12; 16; 20 teeth.
7. High speed steel milling cutters should be ground on wheels of: _____
30; 40; 50; 60 grit.
8. Common iron is made from: _____
Charcoal Iron; Coke Pig Iron; Charcoal Pig Iron.
9. Carbon steel drills are tempered at temperatures close to: _____
1200; 1500; 1800; 2100 degrees F.
10. Diamond vitrified wheels should be operated at speeds around: _____
3500 r.p.m.; 4500 r.p.m.; 5500 r.p.m.

ANSWERS TO QUIZ ON PAGE 241.



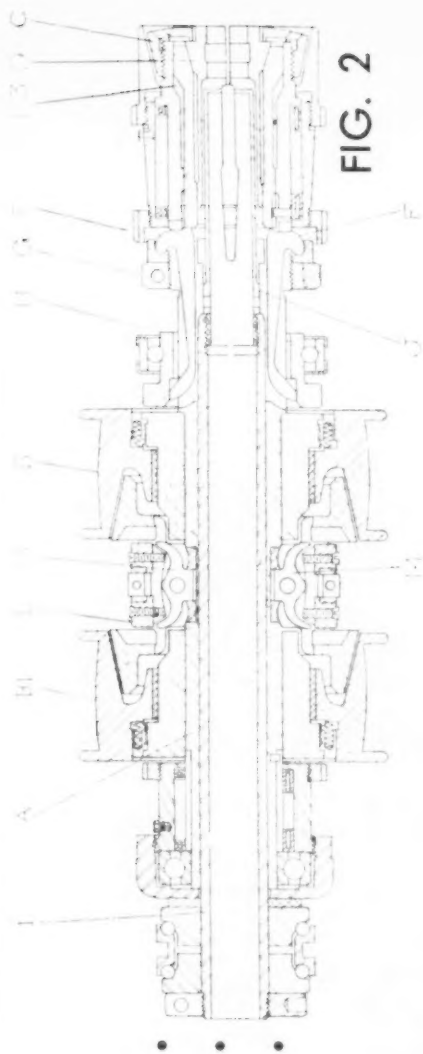


FIG. 2

will be used to identify the working parts of the bottom section.

- Q Back shaft starting shaft.
- Q-1 Back shaft gear clutch.
- Q-1A Change gear set.
- Q-2 Lead cam shaft.
- Q-3 Cross slide cam shaft.

- Q-4 Clutch lever for engaging or disengaging back shaft clutch Q.
- R Turret indexing control carrier.
- R-1A Turret indexing control trip lever.
- R-1 Turret indexing back shaft clutch.
- R-2 Turret indexing back shaft gear.
- R-3 Collet and feed control carrier.
- R-4 Reversing control carrier.
- R-4A Reversing control trip lever.
- R-5 Reversing back shaft clutch.
- R-6 Reversing shaft and clutch.
- S Front slide cam.
- S-1 Rear slide cam.
- C-1 Back shaft collet and feed control clutch.
- C-2 Back shaft collet and feed control gear.
- C-3 Collet and feed cam shaft drive gear.
- C-4 Chuck cam.
- C-5 Chuck cam used on No. 2 machines only.
- C-6 Stock feeding cam.
- E-1 Lead cam lever (see figure 7).
- E Lead cam lever roll (see figure 7.)

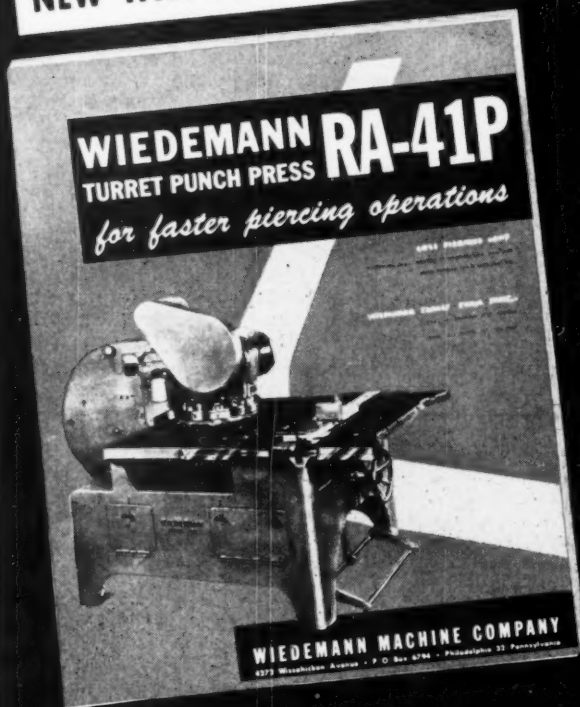
Beginning with gear Q-1, figure 3, through a selected change gear set, motion is transmitted through another set of gears to both lead cam shaft Q-2 and cross slide cam shaft Q-3. The lead cam shaft is located on the right hand end of machine and the cross slide cam shaft, sometimes called, front shaft, is located in front and extends about 2/3 way across the machine.

At the left end of front shaft is located a short reversing shaft R-6. This shaft can be coupled with the front shaft and revolve with it when operations require reverse spindle motion.

The front shaft carries front and rear cams, also two carriers which revolve with the shaft; the short reversing shaft R-6 also carries a carrier. The mechanism shown in the bottom section controls the moving parts shown in top section such as swing stop opening of collet, feeding of stock, closing collet, advancing cross slide and turret tools, changing of spindle speed, speed direction, etc. Without the mechanism contained in bottom section the moving parts of the top section would be inoperative.

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Figure 3-A shows the back shaft separate; connecting lines explain its position when assembled with bottom section. Figure 4 shows a rear view of the machine. The rear cross slide P-1 can be seen, also the change gear set Q-1A in position, since a change gear set could be one of many no attempt will be made to explain them now. The back shaft is shown positioned and its parts identified. The units contained in the back shaft put into motion every mechanical movement that takes place during the order of operations.

On each of the three size and type machines, the back shaft runs at constant speed, ranging from 120 to 240 r.p.m. It makes no difference how fast or slow the spindle may be running, the back shaft speed always remains constant; since this shaft controls the mechanical movements and the speed is constant, it would appear that a given number of spindle revolutions would be sufficient for any and all feeding of stock or indexing movements, but such is not the case; while the predetermined running time required to complete the mechanical

movements does not change, nor does the back shaft speed, more spindle revolutions are often needed while the cam lever roll E drops from the top of one cam rise to the beginning of the next.

When the clutch Q is engaged the back shaft starts turning and the mechanical movements necessary to finish one piece will automatically take place in accordance with a planned order of operations. When the clutch is disengaged everything stops except the spindle.

Beginning with back shaft gear Q-1, figure 4, motion is transmitted through the change gear set Q-1A to cam shafts Q-2 and Q-3. The arrangement of the gearing is such that both shafts are geared together and revolve at the same rate of speed, which depends upon the ratio of the change gear set. They might make one complete turn in one second's running time, or it might require 450 seconds to make one complete cam shaft revolution. The principle of having both shafts geared together, is known as being in time, in other words, synchronized cam motion.

Since these movements are tied in



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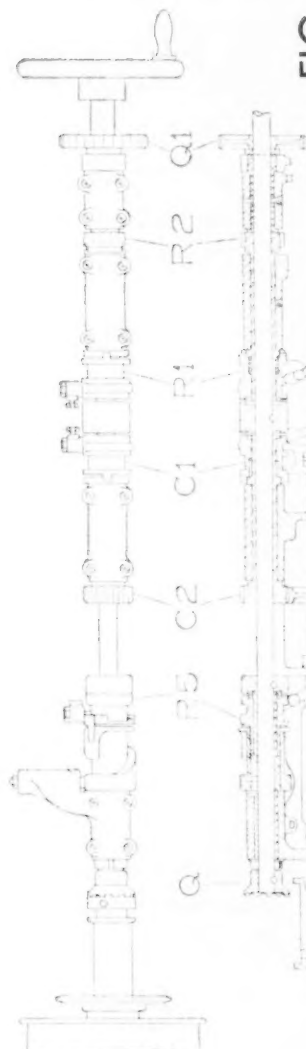
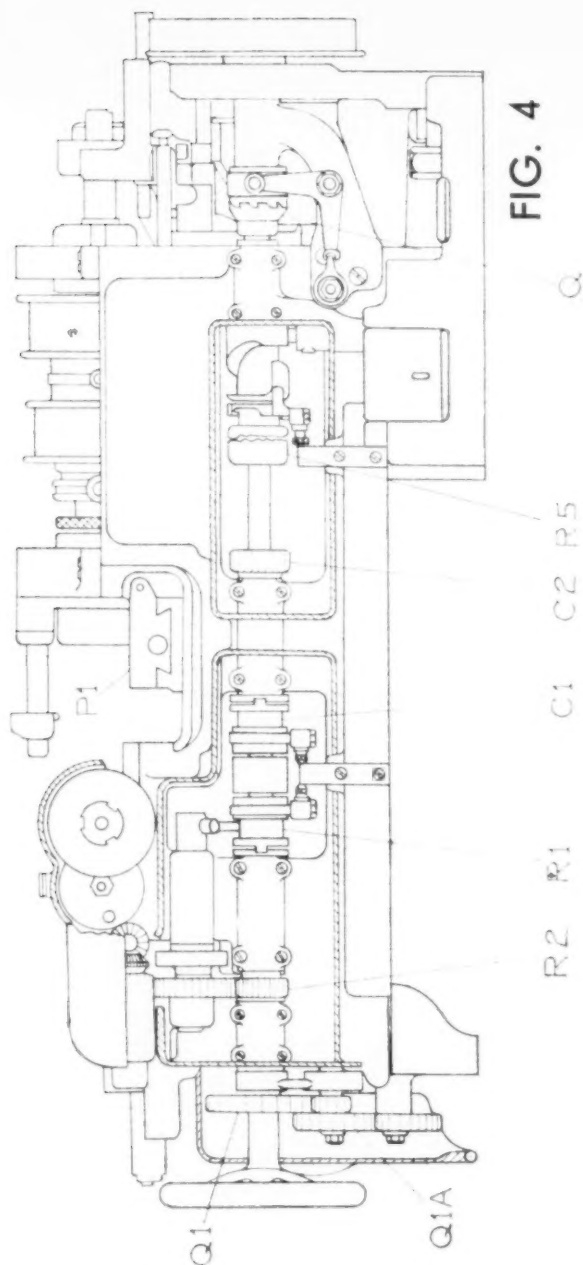


FIG. 3A

FIG. 3





directly with the lead cam, a partial explanation regarding their cycles in relation to the rear cam follows. We begin any cam layout by drawing line A-1, figure 5. It is important the line be drawn through the center of both holes. At the point where the line intersects the cam circumference we stamp the letter O, usually called Zero.

Beginning at Zero, divide the cam circumference into 100 equal parts, called cam hundredths, or CH, cam spaces or CS. The circumference of all

carriers, likewise front and rear cross slide cam, are also divided into 100 equal parts, see figure 5. Since cams and carriers occupy fixed positions and are divided alike, it should be easy to understand, when it's Zero on the lead cam, it's Zero on carriers and cross slide cams.

Referring again to figure 5, we find the cam lever roll is directly over the Zero mark, also the trip dog on carrier R is at Zero. When the dog passes under the trip lever R-1A the back end

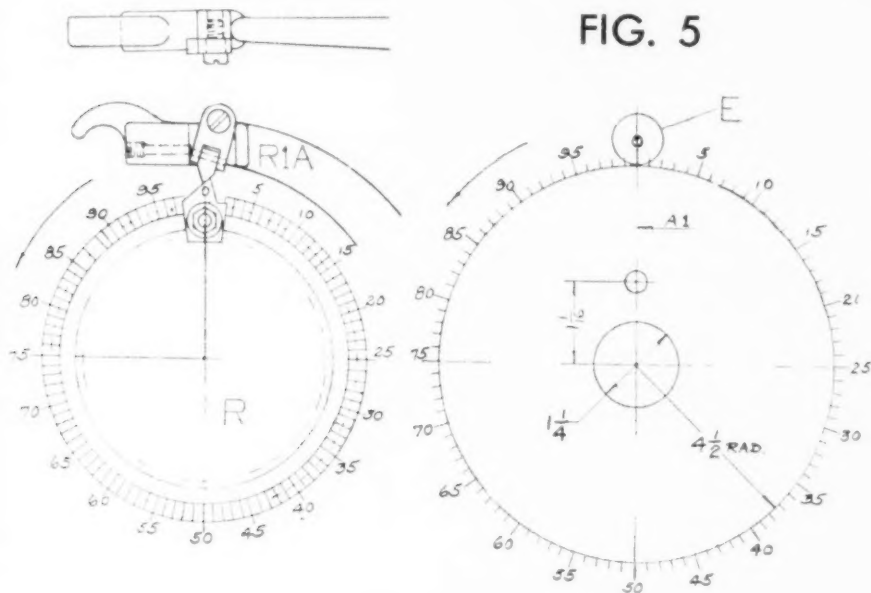


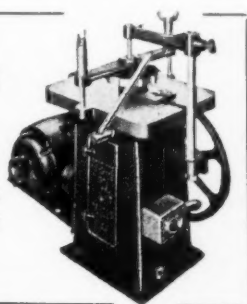
FIG. 5

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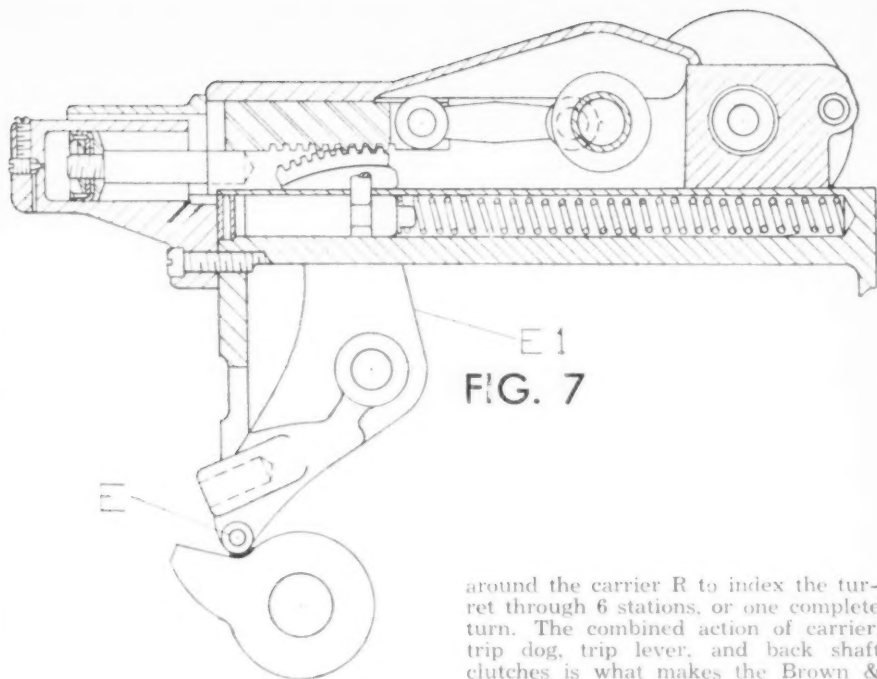


FIG. 7

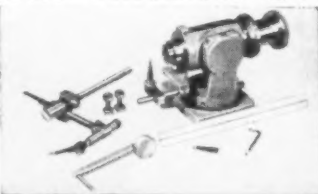
of lever engages with the back shaft clutch R-1, this engagement sets in motion the back shaft gear R-2, and this motion through a train of gears and cams unlocks the turret and causes it to revolve $1/6$ turn. According to shop language, the turret is indexed through one station.

Since there are 6 turret stations, enough trip dogs could be positioned

around the carrier R to index the turret through 6 stations, or one complete turn. The combined action of carrier, trip dog, trip lever, and back shaft clutches is what makes the Brown & Sharpe machine automatic.

A careful study of the foregoing should unfold their relations clearly. Beginning with the April issue, Multi-spindle operation will be the subject. No comparisons between any of the different makes of multiple spindle machines will be made. Throughout the 8 articles to follow, comparisons between single and multi-spindle operations will be shown.

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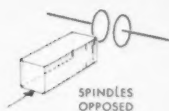
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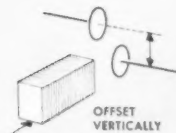
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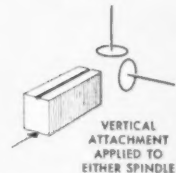
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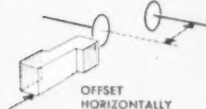
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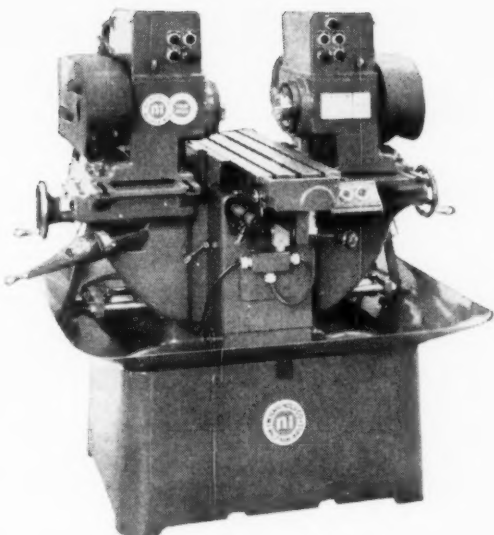
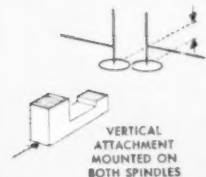
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HOW TO EFFECT 10%, 25%, or 50% ECONOMIES

In Your Machining Operations

by H. A. Frommelt

This is Section 2 of Part 1 of Mr. Frommelt's current series on how to effect economies in your machining operations. Last month Section 1 of Part 1 discussed means and methods of achieving 10% economies on machining operations. This portion of the program is concluded in this installment. Next month the methods to be employed in attaining a 25% reduction in machining man-hours will be analyzed.

PERHAPS the next important item is the specification of the proper cutting tools. If carbide tools are available, the solid clamped-on bit is preferable to the brazed tip, generally speaking. Holders and bits are now available that present not one but several or more cutting edges that can be used successively as cutting edges dull. Moreover, they are so designed that no change in the set-up is necessary when changing from one cutting edge to another. Hence, if carbide is the order of the day these latest developments should be included in the tool specifications.

Proper carbide grades, generally speaking, should not be left to a catalogue reference or an operator's guess. Field engineering advice is available, particularly when some unusual job calls for a trial and error determination. Cast iron cutting grades cannot be used indiscriminately on cast iron. Some cast irons of the controlled type, Brinelling in the neighborhood of 200, call for a different carbide grade from the standard cast iron cutting classification.

Steel cutting carbides should also be carefully selected, particularly when applied to intermittent, or the shock-type of cuts. But these are items about which the supervisory personnel determining machining procedures can easily call for and obtain help with.

The selection of the tool or cutter best suited for the job is another matter, however, and is entirely within the control and jurisdiction of the routing personnel. Thus, there is little excuse for selecting a slab mill instead of face mill for the milling of plain surfaces. The cutting action of the face mill is preferable to that of the slab or peripheral mill. Moreover, it can be and is mounted directly on the spindle of the machine whereas a peripheral mill must be assembled on an arbor always some distance away from column or arbor supports.

Likewise there seems to be little justification to-day for the use of half side mills however intriguing their possibilities of "doing two sides at one time." An electric motor pole piece when machined with a simple inexpensive face mill, one side at a time, had its floor-to-floor time reduced 90%. In addition, the face mill (6" diameter) cost less than 25% of the two half side mills (12" diameter). Finally, the tool grinding cost was reduced 75% and the machine downtime 95%. It required 55 minutes to change the cutters on the arbor set-up and less than 3 minutes to make the face mill change.

One shop used a little ingenuity in designing a multiple toolholder for a turret lathe operation. This reduced the chatter, made possible increased feeds and speeds, and reduced machine downtime, as well as set up time, so that the floor-to-floor schedule was shortened by 30%. This may belong in the 25% program niche but it is worth mentioning as a part of the tool selector's job.

What of the so-called fly cutter in milling? Cutters are now designed with sufficiently small tooth pitch (distance from cutting edge to cutting edge on the circumference) so that narrow surfaces and interrupted cuts are no longer a production department headache. By the same token the fly cutter, whose application may be justified very occasionally, creates its own interrupted cut in a milling operation. Its only justification, if such it can be called, is the situation that does not permit the tool grinding required on a milling cutter. Even then its feed rate is so limited as

compared with a multi-toothed cutter that it is difficult to pass favorable judgment on this tool.

Always select the smallest size cutter for a milling operation consistent with good operation in order to eliminate time-consuming table travel.

Always select simple tools for the simplest possible set-up, other factors permitting. Set-up time and subsequently downtime of the machine are deadly termites to efficiency.

Tool Grinding—Cutting and Clearance

Angles: Perhaps the most abused factor in metal removal is tool grinding. And yet its importance is second to none in determining the efficiency of an operation or plant.

A set of clearance and cutting angles, once used successfully, whether on single point or milling tools, are most likely to be retained and even made standard on routing sheets. No greater mistake could possibly be committed. While it is impossible and even uneconomical to study each job, to say nothing of experimenting with it, to determine the correct or optimum angles, still these factors should not be frozen. Like jobs, of same materials, to be machined on much the same type of machines may even very profitably have an angle change incorporated into their tool specifications.

For example, a small lot job can and should justify larger clearance angles for freer cutting. While the tool life is thus reduced it is, or should be, sufficient for the small lot run. It is seldom wise to return a tool to the crib after a run without re-sharpening. In fact, the feeds and speeds as well as these angles should be so set that the tool is dull when the job is completed. While this admittedly is an ideal, still it can be approached by intelligent personnel routing jobs and specifying these factors.

The older the machine, the greater the wear in its essential parts, hence, the larger should be the clearance angles, generally speaking, for thus, with freer cutting pressures vibrations are dampened. This is likewise true of thin-sectioned workpieces.

Reference was made in an earlier

* Fluid Power Improves Production

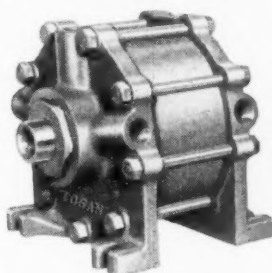
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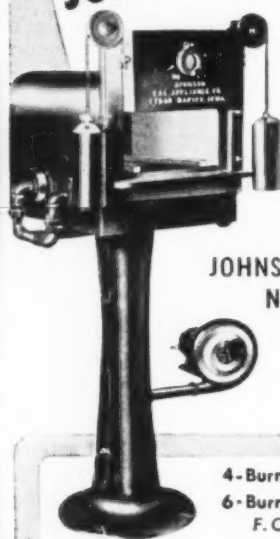
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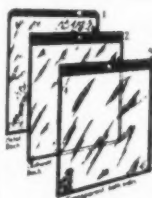
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section (BLUE BOOK, Feb., 1950) to the grind of a milling cutter that will yield a satisfactory finish sufficient to eliminate subsequent grinding operations to say nothing of a second finish milling cut. This is applicable to both High Speed steel and milling cutters and though highly effective is not sufficiently used. It can be made into a great time saver. The grind of the O.D. (periphery) of the blades in a milling cutter is executed in the usual manner so that all these cutting edges are on the same circumference to within 3 to 5 tenths of a thousandth. But the faces of these blades are ground so that one blade is high by 5 to 10 thousandths. And instead of the usual dish angle of 2 degrees for this high blade, its dish angle is zero. Finally the length of this zero line on the face of this high blade must be slightly greater than the feed per revolution (or the chip load per tooth times the number of teeth). To illustrate: suppose an 8" cutter is specified having 20 teeth, with a chip load of .005" per tooth. Under these conditions the length of the zero face line must be something over .100".

If this grind is used for a job specifying a fine finish the result can well be 20 to 30 micro inches. Finish milling cuts as well as subsequent grinding operations are eliminated. The cutting edges on the periphery of this cutter hog off the metal, while the edges on the face finish the milled surface. The high blade acts as a fly cutter removing the last .005", and if the dish angle is a true zero, and its length is as specified above, then the finish will be as indicated. In this eliminating operations on



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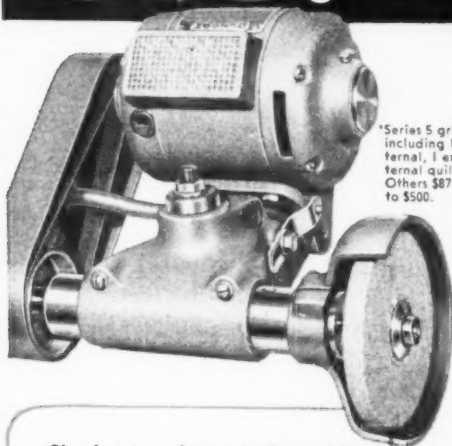
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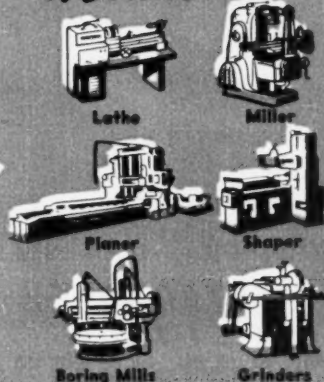
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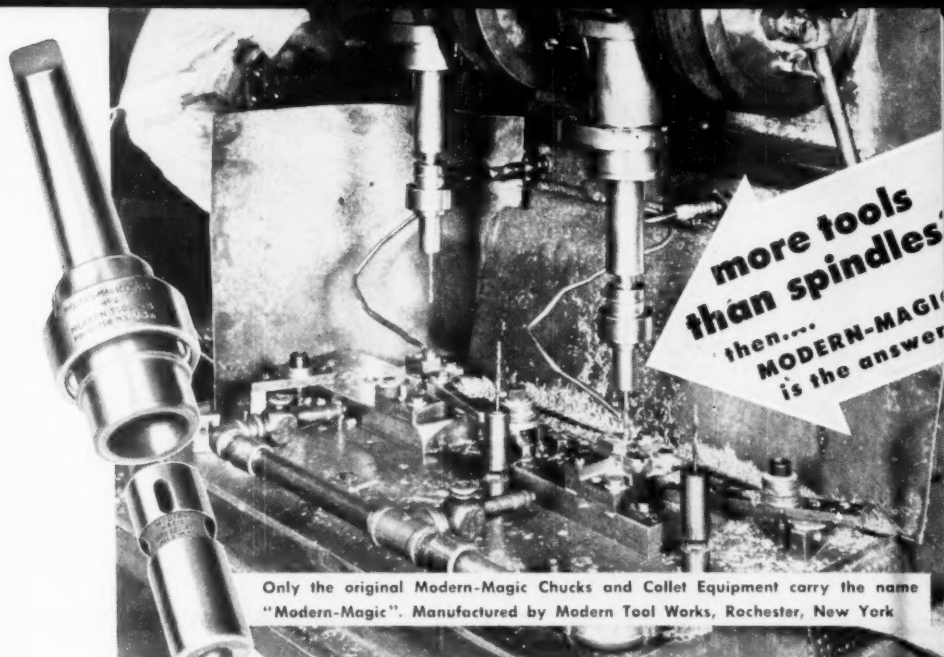
lot is small, the clearance angles should be opened, and even the cutting angles given greater rake. In the machining of steel with carbide this means that the negative radial rake angle should be decreased; in effect, this increases the effective rake angle. These angle changes should be made deliberately with a view to dulling the cutting edges more quickly or at least approximately by the end of the run.

Unfortunately, cutter life is generally, if not always, given in terms of the maximum amount of metal removed between grinds in terms of square or cubic inches. The impression is all too rooted in the production mind that this grind is the one to use for all jobs. Far from it. If a continuous — more or less — job is in the schedule then these so-called maximums should be striven for. But when the job is in the short run class, as indeed most are,

a component, machine loads are not only relieved but the set-up and downtime is materially reduced as well as the handling effort between machines.

Cutting and clearance angles are pretty well standardized for a given material and set of operating conditions. While it is impossible to vary these angles so as to arrive at the optimum for a specific operation, still the application of "metal cutting sense" will call for deviation from the so-called accepted standard. If, for example, the job

then this maximum metal removal between grinds is far from a desirable goal. The clearance angles, as well as the cutting angles, should then be varied to bring about dulling of the vital cutting edges approximately by the end of the run. Admittedly, this is an ideal and until experience points the way, unattainable. Yet, it is an eminently worthwhile mark to shoot at. For, changing angles as indicated in terms of a short run job makes possible freer cutting, lower power consumption, and better finish.



Only the original Modern-Magic Chucks and Collet Equipment carry the name "Modern-Magic". Manufactured by Modern Tool Works, Rochester, New York

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Modern Precision Tools
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The set-up shown above is typical of the increased production obtainable using Modern-Magic Quick Change Chucks and Collet Equipment. Here, the two spindles of the machine, Modern-Magic equipped, perform four separate operations. The tools are quickly and easily changed while the machine runs at operating speed. You don't even have to slow it down.

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Furthermore, if these changes are made in cutting and clearance angles in terms of the size of the job lot, speeds and feeds can be varied with an eye to economy. And this brings us to a discussion of the final important factor in economizing man-hours on machines in this first 10% step.

Setting Speeds and Feeds. Speeds and feeds in metal removal should not be guessed at. There is little excuse for this procedure, in fact, there is every reason to-day for attaching speed and

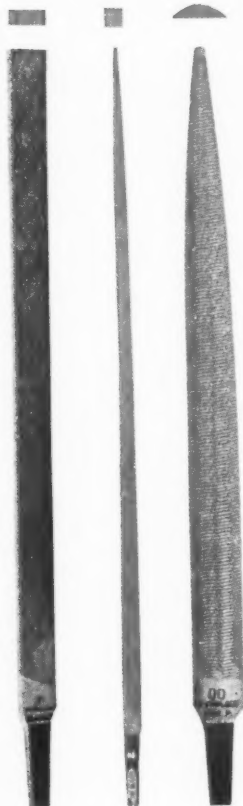
feed specifications to each job as it goes to the machine. There are still mechanics in shops, though getting fewer daily, who can set speeds and feeds instinctively. At least they set these operating conditions seemingly without guide, although their background of experience is actually acting as a guide. Speeds and feeds for various cutting materials operating on any one of the wide variety of materials in components are available from reliable sources including machine tool manufacturers, cutting and tool material manufacturers. These, however, are averages and must be applied with sense and judgment. Usually these tables of surface foot rate and feed are given in terms of maximum tool life. Yet, frequently we are interested in an operation on a job lot of relatively few pieces — certainly much below the number corresponding to maximum life between grinds.

Here then is an opportunity to increase the surface foot rate to the point where the tool will dull approximately by the end of the run. What speed is to be specified is obviously a matter of judgment and some little collection of data on past jobs will act as a guide.

The records at this point are filled with 10% — and greater — economies effected simply by changing the operating conditions on machines. Usually the rpm and feed rates had been set in accord with good practice but also in accord



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LIKE most production-wise foremen, Pop is a bug on the use of tools. He knows that Nicholson X.F. (Extra Fine) Swiss Pattern Files, for example, are the finest finishing files you can buy. And heaven help the man who uses 'em on the wrong jobs!

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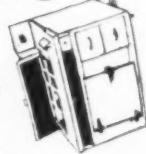


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Attention: Mr. C.

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NOT WHAT WE SAY

IT'S WHAT WE SAY

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letter dated August 18
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If you will check your records you will see that
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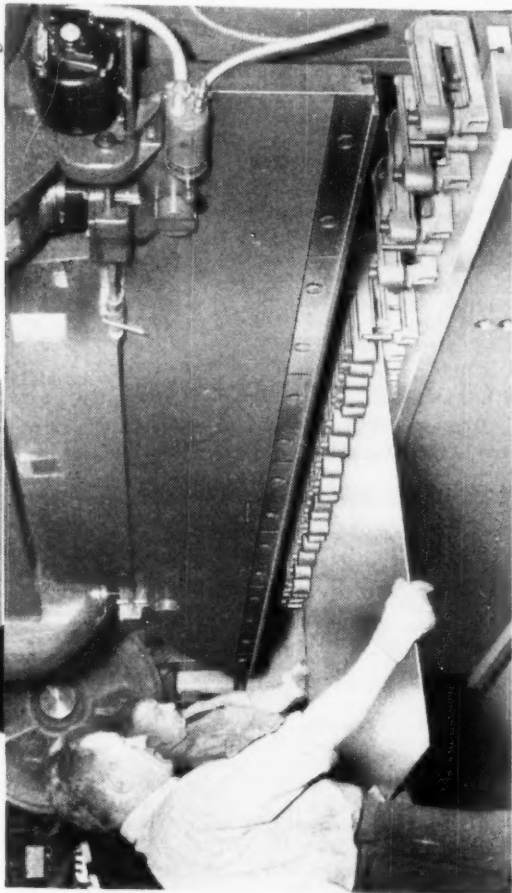
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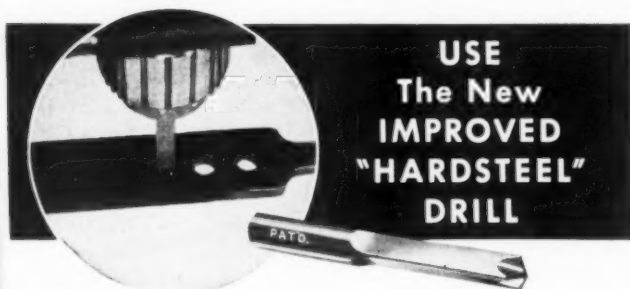
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TOOL BITS
FOR
FASTER,
DEEPER
CUTS**

with specifications that call for maximum cutting tool life. There is no greater opportunity to effect savings than by a judicious variation of speeds and feeds in accord with the above sound maxims or observations. These may be summarized as follows:

1. Determine from available information the maximum cutter or tool life in terms of square or cubic inches of metal removed between grinds for the type of cutting material in hand;

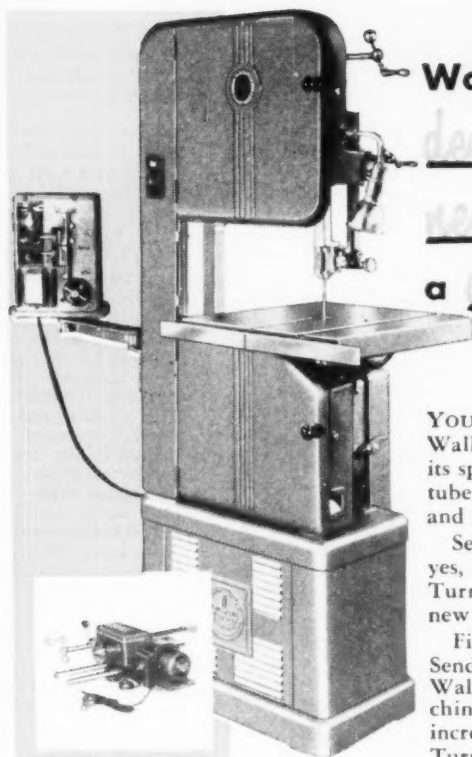
2. Determine the approximate number

of square or cubic inches of metal to be removed from the components or workpieces in the job lot in question;

3. Increase the cutting speed and feed inversely as the amount of metal to be removed is less than the maximum specification in No. 1.

Example: if a certain grade of carbide is rated to remove 20,000 square inches of SAE 1020 steel between grinds in a milling operation, and if the number of square inches to be removed from the 20 pieces in the job lot in question is 10,000, then the speeds and feeds can safely be increased. If the specified SFM is 400 feet per minute the new rate can safely be set at 25% higher. This means that if the feed rate has been 20" per minute it will now be set at 25". This may well mean 10 to 15% decrease in the machining time, assuming that the handling time has not changed.

As stated previously, the record book is filled with 10% economy goals achieved solely by a judicious change of speeds and feeds. This does not always mean increasing these operating characteristics; the record book of a plant manufacturing compressor equipment reveals that in 5% of the changes called for in speeds and feeds, the direction was downward. This resulted in better finishes, better tool life, less downtime on the machine and fewer rejects by the quality control department. The others, however, were



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YOU'd have to *work* with the revolutionary Walker-Turner 16" Band Saw to appreciate its speed and accuracy. Cuts sheets, rods and tubes of steel, iron, aluminum, brass, alloys and molded plastics.

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NEW POWER FEED protects blade against distortion. Motor driven, it maintains a pre-set feeding pressure. Easily adjusted for blade condition and various types of material.



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PNEUMATIC



Helpful BULLETINS

Bulletin 110 (Left) "HANNIFIN
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Bulletin 210 (Right) "HANNIFIN
PNEUMATIC CYLINDERS"



always yield economy results as indicated above.

The overall economy resulting from speed and feed adjustments in a plant manufacturing hydraulic equipment and parts was 12%. Again, some of the rates were set lower to bring the tool life up and thus decrease machine downtime. The remainder were increased to decrease the floor-to-floor time and at the same time obtain optimum tool life. An appreciable gain was effected in some operations by changing both the cutting rates as well as the cutting and clearance angles. This combination adjustment resulted in superior finishes that eliminated operations and time saving in the assembly.

Tool and Cutter Grindings. One of the major points of attack in the economy drive in this first stage is tool and cutter grinding. The record book indicates that faulty and incorrect tool and cutter

upward. The resulting plant economy was 15%. The number of machining man hours per week in this establishment was 16,000—400 operators working 40 hours weekly.

It is interesting to note that the new rates of speed and feed were not "frozen." The production personnel merely appreciated the possibilities for economy in changing machining characteristics as the job lot size varied. An intelligent, though brief, analysis of a job, its job lot size in terms of the standard speeds and feeds for maximum cutter and tool life will

grinding technique heads the list of weaknesses in manufacturing plants. This refers not to cutting and clearance angles but to the method or technique of grinding including materials and equipment specified for this purpose.

Faulty and incorrect grinding methods result in damaged cutting material that fail early on the production line. This results in losses due to increased machine downtime and decreased production.

Grinding difficulties arise principally from two sources; use of incorrect abrasives, and faulty grinding technique by

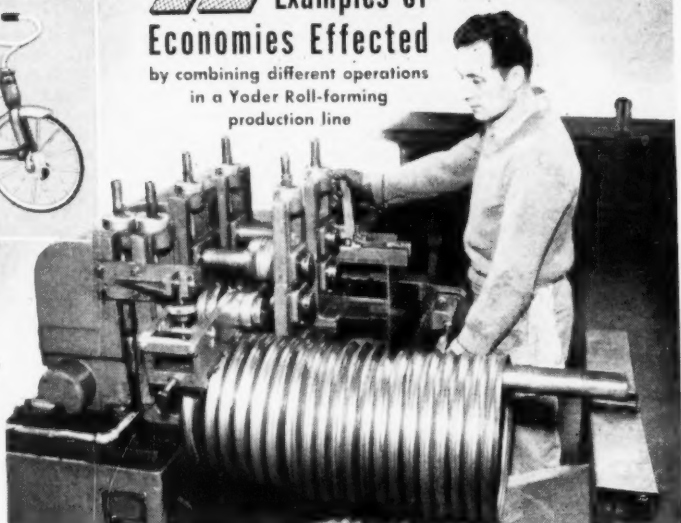
* 12 Examples of Economies Effected

by combining different operations
in a Yoder Roll-forming
production line



* NO. 6

Flat Strip
Continuously
formed
and Coiled
into Wheel
Rims



The forming of wheel rims and rings for many purposes, can be done continuously, in a single passage through a Yoder cold roll forming machine equipped with a suitable coiling device. The coils may simultaneously be cut to length, coming out as individual rings, of almost any thickness, profile design, and diameter.

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Flat rolled metal up to 1/4" thick, of almost any width can be cold formed into structurals, mouldings, panels, tubes and other hollow sections. Production upwards of 30,000 feet

per day is obtainable, usually with only one operator, employing flat strip in coils or cut lengths.

This invests Cold Roll-Forming with infinite possibilities for drastic cost reductions in the mass production of structurals, mouldings and other components for buildings of all types, automobiles and other vehicles, furniture and fixtures, household appliances, toys, bicycles, etc.

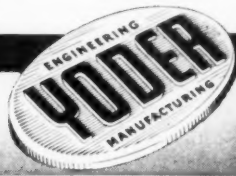
Yoder engineers are at your service in designing roll forming production lines to meet individual needs. Literature, recommendations and estimates for the asking.

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Complete Production Lines

- * COLD-ROLL-FORMING and auxiliary machinery
- * GANG SLITTING LINES for Coils and Sheets
- * PIPE and TUBE MILLS—cold forming and welding



the operator.

Experienced, or at least instructed and supervised tool grinders, must be designated for this operation no matter how small the organization. A central grinding department is the first essential. A paper machinery manufacturer employing a total of 30 men increased its overall production 7% by designating one man for tool grinding. Tool and cutter failures decreased immediately and these in turn decreased machine downtime. A supervisor, whose duties were lightened by the renovated metal removal practices, carried the additional work of tool grinding with the help of a machine operator with free time on his hands after modernization.

It is interesting to note that in this paper manufacturer's plant, the better finishes due to better—or correct—grinding decreased assembly time by an appreciable amount. Moreover, none of the cutting rates was "frozen" although averages were set in the light of good current practice. As the lot sizes vary—up or down—these rates are varied accordingly along lines of a previous dis-

cussion. End of Section 2, Part I. Next month will feature Part II, the 25% Economy Program.

Promotion of five executives has been announced by Howard P. DeVilbiss, president of the DeVilbiss Company, Toledo, Ohio. **William A. Delger**, former plant manager, became vice president in charge of manufacturing; **Don J. Peeps**, chief engineer, was advanced to vice president in charge of engineering; **John M. Robinson**, treasurer, was elected vice president and treasurer; **Frank R. Pitt**, the company's legal counsel, was named secretary, and **R. Miles Booth**, member of the treasurer's staff, was appointed assistant secretary and assistant treasurer.

The Joy Manufacturing Company, Pittsburgh, Pa., has announced the appointment of **R. G. Gehlsen** as sales manager, and **H. B. Zeppenfeld** as manager of industrial sales, both of the Mines Equipment Division of Joy.

WHAT DO YOU KNOW?

By Professor Herman Reichardt

I thought that we might have a general quiz this month on metalworking operations. On this test, if you get 90-100 (ten points for each correct answer), you are an all-around man; 80-90 shows you are still in circulation, as you Americans say; 70-80 is tolerable; and we will reserve below 70 for the apprentices.

1. Before planning a plant layout, a time/motion study should be made for each machine operation.

True: False.

2. In welding, the longer the unshielded arc, the better the results.

True: False.

3. The "nicked teeth" of a milling cutter permit coarser feeds.

True: False.

4. High speed steels are not usually used for:

Drills; Reamers; Dies; Broaches; Shear Blades.

5. The Koldweld Process of welding aluminum, copper and other non-ferrous metals without heat was developed in:

United States; England; Germany; Russia.

6. The major function of cutting oils on automatic screw machines is to:

Keep Tool Cool; Keep Machine Clean; Wash Chips Away.

7. Dressing a grinding wheel means:

Removing dull abrasive grains; Squaring the surface.

8. Magnesium has a specific gravity of:

.94; 1.74; 2.54; 3.14.

9. Magnetic inspection of steel was found possible in:

1850; 1917; 1935; 1940.

10. A precision tool with cutting teeth, that performs work in a manner similar to a file, is called a:

Burr; Drill; Countersink; Broach.

ANSWERS TO QUIZ ON PAGE 239.

LENOX *Skip-a-Tooth*

TRADE MARK REG.

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This type of saw has coarse teeth . . . 2, 3, 4 and 6 per inch.
Especially adapted for soft metals that have a tendency
to stick or clog in the Gullets of the saw teeth.

Advantageously used on many operations in sawing.

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Carbon
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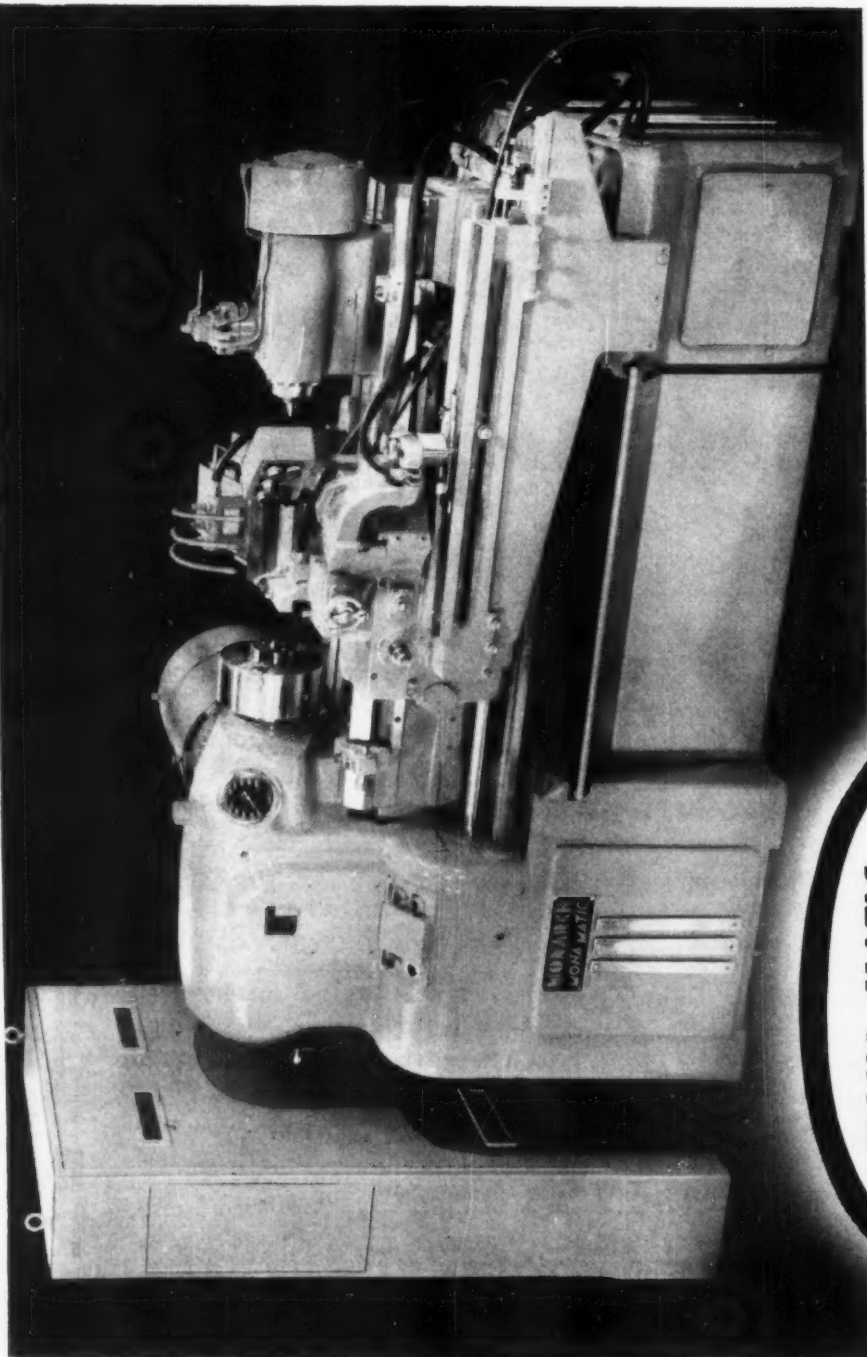
Hard Woods

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"Skip-a-Tooth" Band Saw Blades are advantageously
used on soft sticky materials inasmuch as the tooth spacing
with its wide gullet permits freer chip clearance than the
conventional even tooth spacing.

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or Multinle Tooling Methods

IFT'S TALK

PRODUCTION!

Would you rather get 160—or 120 parts per hour? It's just as simple as that.

One man, operating two Mona-Matics, can produce 160 of these steering knuckles every hour. This same man tending *four* multiple tool automatics, gets only 120 parts an hour!

But bear in mind that production is not the whole story of the Mona-Matic's outstanding ability to cut your costs. You'll save on setup time, on tooling costs, on accuracy, on power consumption and on floor space, too. For the full facts on how Monarch's famous Mona-Matics will outperform any ordinary multiple-tool machining method, write for Bulletin 1801.



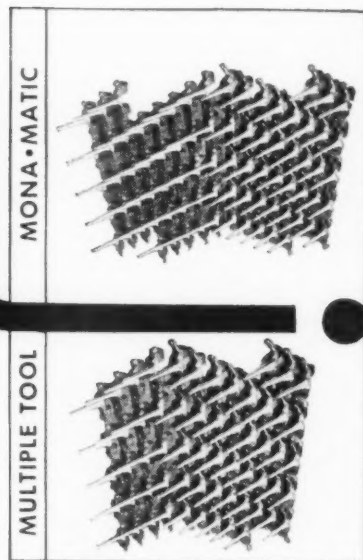
Monarch
TURNING MACHINES

COMPARATIVE CASE STUDY

Part—Steering Knuckle,

SAE 1045, turned section— $5\frac{3}{8}$ " long,

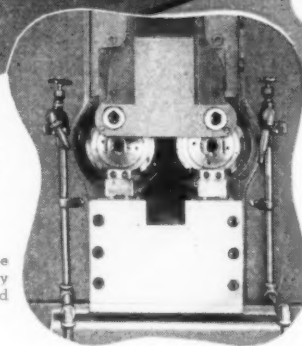
$3\frac{1}{4}$ " to 3" diameter



Production	Multiple Tool Automatics (Battery of Four)		Mona-Matics (Battery of Two)	
	120/hour	160/hour	120/hour	160/hour
Cutting Tools	Cemented Carbide	Cemented Carbide	Cemented Carbide	Cemented Carbide
No. of Tools	40	40	4	4
Cost of Tools (including one replacement set)	\$4220	\$4220	\$187	\$187
Setup Time	28-30 hours	28-30 hours	46 minutes	46 minutes
Total Horsepower	80-120	80-120	40	40
Floor Space	150-200% more than Mona-Matics	150-200% more than Mona-Matics		
Subsequent Grinding Operations			50% less time than multiple tool	50% less time than multiple tool

THE MONARCH MACHINE TOOL CO. Sidney, Ohio

Illustrated at right are
spindles and heavy duty
forming slides with guard
removed.

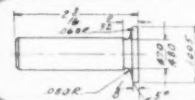


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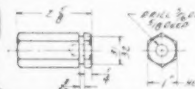
Production: 1100 pcs/hr.
(@ 100% eff.)



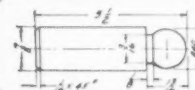
Production: 720 pcs/hr.
(@ 100% eff.)



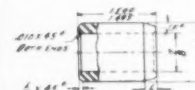
Production: 720 pcs. hr.
(@ 100% eff.)



Production: 680 pcs/hr.
(@ 100% eff.)



Production: 510 pcs/hr.
(c. 100% eff.)



Material: Seamless tubing—SAE 1020.

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Letter from England



Written for the MACHINE and TOOL BLUE BOOK by Robert Hutcheson, Editor of MACHINE SHOP MAGAZINE, London, England.



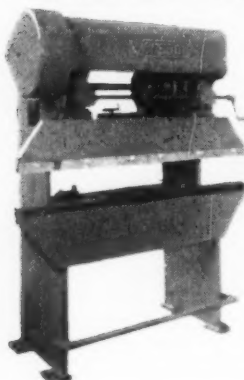
The process known as cold welding which was developed in the research laboratories of the General Electric Company Ltd. at Wembley, near London, is beginning to find commercial applications. It is used for the uniting of ductile metals using only pressure with an entire absence of heat and so it is lending itself to the solution of many jointing problems where applications of high temperatures would be inadmissible. The Pirelli-General Cable Works, Ltd., an associate company, are now using the process for the production on a commercial scale of aluminum sheathed cable. Aluminum strip is formed into a U-section by passage through rolls and the two sides of the U pass between scratch brushes which prepare their surfaces for welding. The cable and the sheath are then brought together and passed between rollers which close the sheath into a tube form around the cable leaving a pair of fins or flanges which are cold-welded together by being passed through pressure rollers. After welding, surplus flange material is trimmed off and the joint is smoothed by being passed through peening rollers. The sheathing produced by this method is continuous, the aluminum strip being brazed to form a continuous length in such a way that it does not interfere with the subsequent welding process. Cables up to 1½ in. diameter can be sheathed in this manner and further developments are in hand. Tests show that these cold-welded aluminum sheathed cables pass the various tests to which metal covered cables are subjected and that they are both lighter

and mechanically stronger than lead covered cables. The General Electric Company Ltd. say that rubber and plastic covered cables can be sheathed and the process can be extended to oil-filled cable, and that the complete absence of heat in the welding process makes the process suitable for work that cannot be undertaken easily by conventional sheathing methods.

During the Festival of Britain in 1951 it is proposed that British science and technology will form an important section of the Exhibition side of the Festival. Exhibits depicting achievements will be displayed in London both at the centre of the Exhibition, which is now being prepared on the south bank of the Thames, and at the Science Museums. There will be another exhibition of industrial power in Glasgow and a ship is being fitted out as a travelling exhibition to call at ports around the British coast. Another travelling exhibition is being designed to reach the important inland towns.

During the run of the Festival of Britain, various engineering organizations will be active; for example, the Gauge and Tool Makers' Association will hold their third exhibition in London from 15th to 25th May, 1951. The British Association for the Advancement of Science will direct their 1951 meeting towards the furtherance of the aims of the Festival and several of the learned associations attached to the engineering profession will do the same.

Slash metal forming costs...



Shops that are wasting manpower with hand brakes or tying up big machines with small odd jobs have the answer to their problems in the new Verson 16-48 Press Brake.

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THERE'S A VERSION PRESS BRAKE FOR EVERY JOB
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The General Election, by means of which a new Parliament will be elected, will be held in a little over three weeks' time and the electioneering campaign is just beginning to come into swing. The Conservatives under the leadership of Mr. Churchill, are promising to put a stop to nationalisation and also to give relief from some of the heavy taxation under which all sections of the community are staggering. In fact, they are promising to more or less obviate the restrictions under which industry labours

today while maintaining full employment and a high standard of living. The Labour Party also promise full employment and propose public ownership of beet sugar manufacture, sugar refining, cement manufacture, water, cold storage and meat distribution, while the nationalisation of the steel industry will be put into effect. Food subsidies will continue, as will the bulk buying of meat and it is proposed that various marketing organisations will be set up for wholesale and retail distribution of foodstuffs. Sir Stafford Cripps has promised development councils for industry which will increase the efficiency of the industries for which they are formed and each committee will consist of representatives of manufacturers and work people in the industry together with independent members.

* * *

Coal. We are still being told that

output of coal is hampered by absenteeism. Viscount Hyndley, Chairman of the National Coal Board, referred to this a few days ago. He said that the target output was based on an increase per man shift during this year and this will be essential as man power in the mining industry has fallen. Last year it fell from 726,000 to 709,000 and Lord Hyndley forecasts that by the end of this year man power will have fallen by another 9,000.

* * *

Unemployment. When the last count of

**INCREASES
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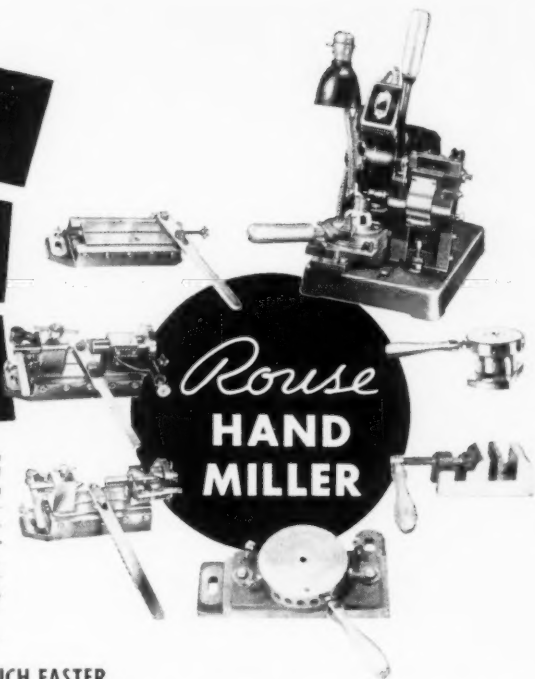
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the number of unemployed was made on December 5th, 330,336 workers were registered as unemployed and this is the highest since March 1949. During November the total number in civilian employment rose by 52,000 and judging by the figures given for changes in the number of employees in various industries there must have been a considerable number of people changing jobs.

Shipbuilding. The condition of our shipbuilding industry continues to give

anxiety in some quarters. According to Mr. H. B. Robin Rowell, President of the Shipbuilding Conference, British yards completed last year 1,400,000 gross tons of new merchant ships, but new orders that were placed during 1949 amounted only to 400,000 tons. While many yards will be busy for a year or more, new orders must be stimulated if the costs of shipbuilding in British yards are to be kept down. This would appear to call for something more than a mere selling technique because Mr. Rowell blames the high cost of British shipbuilding for the shortage of new orders.

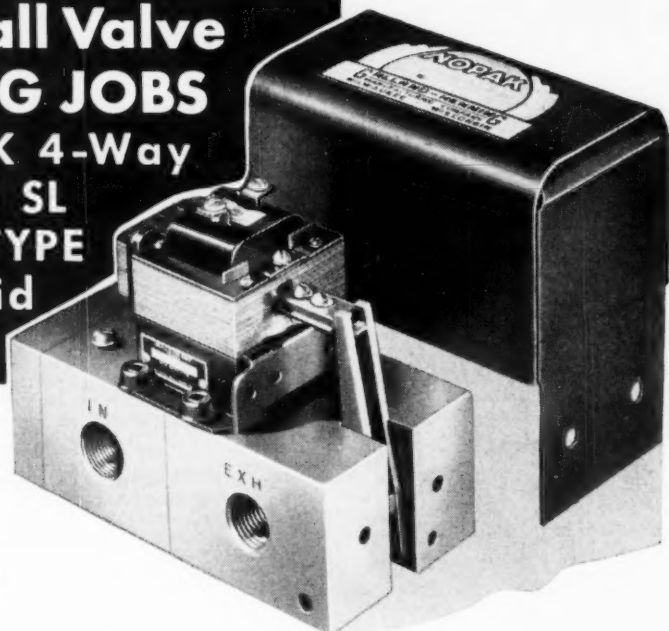
The President of the Chamber of Shipping, Mr. Colin C. Anderson, at Newcastle, has complained about one aspect of State control which he says is partly responsible for lack of orders for new ships. Before the war it was the practice of ship owners in this

country to sell their ships long before the time when they would have considered the ships needed scrapping. In this way some of the money required for the building of new ships was obtained. Today, however, the Ministry of Transport refuses to give a free hand to British ship owners to sell their unwanted vessels abroad and thus, says Mr. Anderson, funds that could have been made available for rebuilding are being forcibly locked up in unwanted ships.

The Sheffield steel industry is watching the shipbuilding situation closely be-

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Weight 5¾ lbs.,
5⅞" long, 3"
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Cylinder Ports
may be reduced
to ⅜" or ¼".



Does the work of bulkier, heavier and costlier solenoid valves of same capacity. Designed for air operation only, at pressures from 40 to 250 P.S.I. Functions effectively mounted in any position. Employs solenoid-actuated pilot rather than direct solenoid pull on sealing mechanism.

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3. Standard Solenoid Unit — easily replaced, readily available.
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5. This valve gives you long-run, high speed operation . . . up to 500 cycles per minute . . . or continuous energization in one position.
6. Sub-Plate mounting furnished at extra cost, if desired.

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cause the shipyards constitute one of the biggest steel using sections of British industry and it seems that the reduction in orders for shipping is beginning to have its effect on the steel industry.

The power of the winds is well known and in days gone by the windmill was a familiar sight in this country. Today, however, although there are a few wind-driven mills grinding corn, the bulk of our windmills are regarded as relics of the past and are more in the nature of museum pieces. However, a scheme is afoot to build a windmill for the generation of electric power. The windiest area in the world is on the west coast of Scotland, between Shetland and the Mull of Kintyre and it is here that a one hundred kw windmill is to be built on the Orkney Island by John Brown & Company, Ltd.

A \$650,000 improvement program was announced by the Nineteen Hundred Corporation, St. Joseph, Mich., manufacturer of home laundry equipment.

Elisha Gray, president, said that the project will give the firm increased and more efficient production, will provide improved working conditions for the company's employees.

The program includes purchase of more than 15,000 feet of overhead conveyors to carry parts until they are needed for the assembly line. Suspended just under the roof of the plant, the conveyors will serve virtually as a circulating warehouse. In addition to releasing a large area now used for storage, space will be made available for installation of new production facilities, Gray said.

Other items already scheduled include the latest in automatic equipment for heat treating steel; a rotary disc grinder to turn out better gear cases more efficiently; a 50-ton truck scale, accurate to five pounds; and six large transformers to increase the plant's welding capacity.

HARRY J. MERRICK

Harry J. Merrick, executive secretary of the Cutting Tool Manufacturers Association, died suddenly early Monday morning, December 12th, at his home, 1356 Lochmoor, Grosse Pointe, Michigan. Merrick was born in Scranton, Pa., April 5th, 1903, received his B.A. from the University of Michigan in 1926 and Bachelor of Law from Fordham University in 1930.

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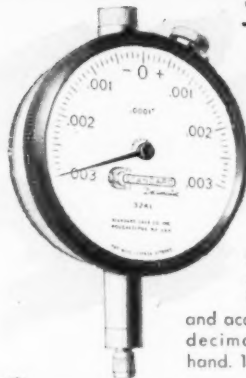
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Made in 22 models including 4 dial diameters, 7 different graduations. Also 90° models (stem perpendicular to back). Long Range and Long Stem types.



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You wouldn't treat your watch the way some indicators have to be treated. Standard Dial Indicators are built to give continuing accuracy while standing the knocks.

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**Outstanding Reason for the
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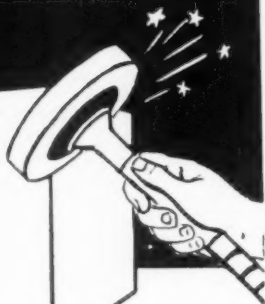


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as: dependable, constant speeds — rugged construction — low maintenance and a complete line of accessories and attachments recommend your early investigation of their cost-cutting possibilities in your plant. Get complete details. Consult your classified phone book for the Haskins Engineer nearest you or write to: R. G. Haskins Co., 2645 W. Harrison St., Chicago 12, Ill.



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FLEXIBLE SHAFT EQUIPMENT

Foremanship Forum

by EDMUND MOTTER\$HEAD

FOREMEN WANT TO KNOW ABOUT BUSINESS

“WHAT do foremen and supervisors want to know about business?” The fact that such a question should be raised at all has various serious implications. First: it implies that foremen for a great part are either ignorant or indifferent to business conditions and principles, or that they are kept in ignorance of such matters. Second: it implies that there is in existence a body of factual material and a group of principles and theories with which they should be thoroughly conversant. Third: it implies a direct responsibility of top management to see to it that foremen are given what they want and need to know about business, and more particularly, about the business in which they are engaged.

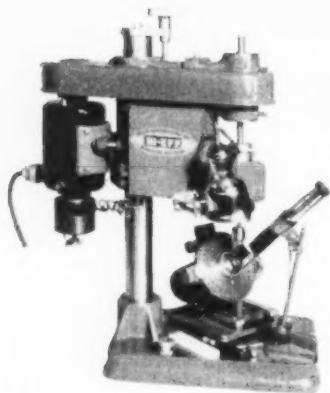
Reports in newspapers and business journals indicate that at least a large number of leading American corporations are still showing very substantial profits. Most businessmen expect that this will not last indefinitely.

The basic problem facing the top management of any business is the same now that it has always been: to stay in business, protect the investors' capital, and make enough profit to justify the investment. To accomplish this, top management employs the services of a host of "experts" on law, taxation, labor relations, personnel management, personnel training, sales management, market analysis and many more, all of whom have but one thing to contribute to management's success — INFORMATION. Top management realizes that in as complex an economy as ours has developed into, it is impossible to acquire individually most of the technical knowledge of business conditions necessary for the intelligent operation of the business.

Businessmen are still seriously perturbed over sources of supply for manufacturing operations; rising costs in every

line coupled with uncertain labor conditions, new and untried union-management relations, and a vacillating foreign policy have added handicaps to a situation which has only recently passed the critical stage in many lines. Consequently, management is eagerly searching for new information on these problems.

The simply expressed problem of "boom or bust" occupies considerable attention, and in some circles is giving rise to more blood pressure than anything else. The fact that building costs are still rising coupled with the fact that nothing so far has been done to ease building craft union restrictions or the many restrictive building codes seems to indicate that our 141 million people will face an inflated real estate market for some time to come, possibly for another four or five years until residential building catches up with demand even at the present high prices. We have already surpassed Henry Wallace's 60,000,000 jobs. What was once a dream is now an underestimate. At the same time, agricultural-industrial states such as Illinois are showing an increase in industrial unemployment as manufacturers adjust their production programs. If any management can determine for itself the answer to the probable length of the present "boom," plans can be made which may make the difference between outstanding profits and business failure in the next two or three years. The largest wholesale jobber of general merchandise not long ago wrote off a matter of \$7,000,000 inventories as unsalable, fired the president, 4 vice-presidents and 26 regional managers in an attempt to readjust to current conditions. Management is desperately looking for information, for FACTS, to make decisions which will insure the success of the operation.



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It goes without saying that whether by design or accident, foremen and supervisors are to a large extent ignorant of these diverse factors which directly affect their company and in turn affect their own jobs. The American Management Association some time ago conducted a survey of more than 100 companies which had foreman-supervisor manuals. Over 336 individual topics were listed as being culled from the 100-odd manuals, under such broad topics as company history and organization, labor relations, hiring and placement, training,

there is such a thing as an "average" man, we might say that Joe has a high-school education, or its equivalent, plus his years of direct job experience. He has been taught, or has picked up, some smattering of the thinking of "free enterprise," but finds that idea hard to swallow in the fact of modern monopolistic competition. He has been taught the theory of supply and demand in a free market, but his daily experience proves that prices in our modern economy are relatively rigid, dictated by "cooperation" between big business rather

the foreman's job, general personnel administration, safety and health, accounting, production planning, maintenance and work simplification. ONLY SIX TOPICS listed might possibly be construed as those which would give foremen some knowledge of business conditions and of the business where they were working: history of the company, labor legislation, labor supply sources, press and radio relations, cost control, and the supervisor's labor and material budget!

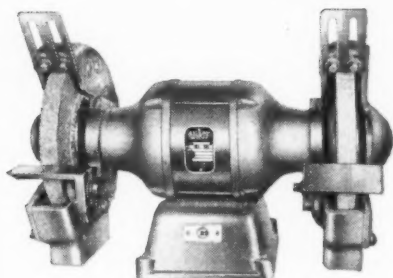
Let us not labor the point. Aside from what they pick up themselves from newspapers, radio, and magazines, foremen and supervisors are for the most part lacking in the essential business information necessary for an understanding of management policies and decisions.

Let's look at Joe Foreman: who is he; what does he believe; what does he think about? If

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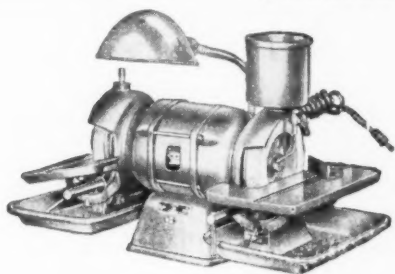
BALDOR heavy-duty GRINDERS are balanced 2 ways: each rotor is dynamically balanced; each wheel is balanced with Baldor's patented flanges. Fully guaranteed.

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easily bites off the bur left
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Ten standard sizes for 1/4 to 2" diameters.

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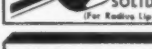
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demned "make-work" and "delay-work" this king of labor in order to make the job last longer makes a certain rough sense to him. When he became supervisor, he lost the support and backing of a labor organization within which he had some status as an individual and had felt some strength, while he has remained for top management a glorified flunky to be by-passed by staff departments and top executives (to say nothing of the union steward until recently) in their relations with his working force.

He has received "training" in budgeting, in managing his department, in cost controls, in labor relations, job training and a host of other matters; yet while responsibilities increase, his authority decreases, and while organized labor forces management recognition in terms of incentive plans and higher pay he finds himself out on a limb from which he can

exert no similar leverage to better his own income.

The problem of giving foremen the information they need about the business and about business conditions in general affecting their own situation is only a part of the larger problem of integrating the foremen and supervisors into management. Elsewhere we have considered some of the elements of a program to make them truly a part of management: pay them enough; give them authority commensurate with responsibilities; back

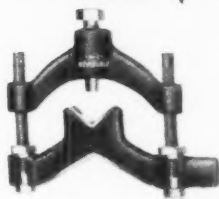
than by normal supply and demand. He has been fed the usual pap about the American Success Story, from office boy to president, etc., but in far too many instances is working under the direct supervision of some young incompetent who happens to be the boss's nephew. In most cases he has come up from the ranks of where he was told that the key to prosperity is production of more and more goods (which it is), but where he saw plentiful production rewarded by mass lay-offs so that the much con-

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Shop lights come in a complete range of sizes and can be purchased with various types of mountings.

All models have Underwriters approved cords, plugs and sockets. Each model is finished in grey baked enamel and comes complete with green parabola shade.

The No. 2000-1 shop light is one of our most popular models. This light can be mounted on either horizontal or vertical surfaces. Available in 24", 30", and 44" lengths.

\$4.80 EACH in lots of 12
(Quantities of 6 @ \$5.40 ea.)
(Single Units @ \$7.20 ea.)

Manufactured by
Chicago DIE CASTING MFG. CO.

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them up in their decisions; establish supervisor and executive merit-rating; consult them as to their opinions before making top-level decisions; bring them in on the "inside" of management thinking. Giving them information can be carried out effectively only within the framework of some such general program.

What information should be made available to foremen and supervisors? Two types: 1. Information which interprets and analyzes current business conditions and which puts the individual

company in the picture so as to explain broad management decisions in this area; 2. Information which analyzes and interprets conditions within the company which determine the way in which top management moves to meet outside business conditions . . . and which puts the individual foreman in the picture in such a way that he sees the relationship of conditions in his department with the whole.

Specifically, foremen should be given a boiled-down version of most of the high-priced technical knowledge management obtains from news-letters, management engineers, business services, professional consultants of one kind or another, so that they understand general business conditions affecting the company. Second, they should get a clear break-down of internal company conditions, financial, inventories,

personnel problems, personnel market conditions, sales programs, market research reports, and a host of similar information commonly restricted either to specific departments or to the top management level.

What will be accomplished by all this? By itself, the results are hard to predict. Perhaps some foremen might quit when they discover bad internal conditions; possibly others will demand salary increases; many should feel more a part of management and be in better position to carry out their tasks. However,



more powerful, more compact lighter weight drills

Here are the perfect answers to the rapidly growing demand for shorter, less bulky, high output industrial drills. They are Miller's Falls new, close coupled No. 438 $\frac{3}{8}$ " Heavy Duty and No. 512 $\frac{1}{2}$ " Standard — two great new models with performance unexcelled by any other drills in their price class.

Incorporating the very latest in design and engineering, they pack tremendous power and endurance into remarkably small dimensions. Only 14" overall, they measure a bare 11" with spade handle removed. Thus they permit work in extremely close quarters . . . the difference between minutes and hours on many maintenance jobs.

They are light, too — only 9½ lbs. — yet their powerful motors and full anti-friction bearing construction give them exceptional efficiency for continuous production work.

Whether you use portable electric drills for maintenance or production, you'll find it well worthwhile to try out these superlative new tools. They are truly outstanding performers. Write today for full details and name of your nearest distributor.



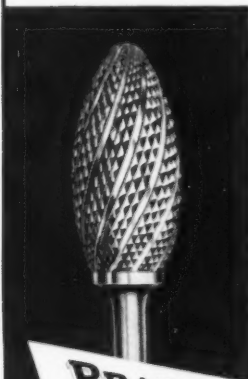
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is already making good progress along this line with a special Supervisor's News Letter, similar in content and general pattern to the various newsletters received by top management. The method must be selected to fit the information and the group involved.

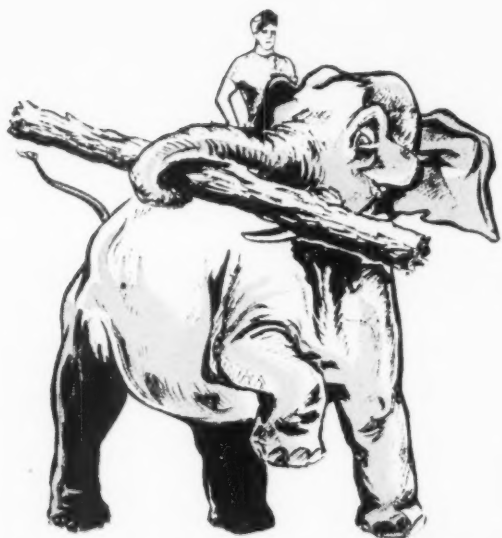
However it is done, top management has an inescapable responsibility to provide this information to the supervisors and foremen. The most important thing to the foreman, just as to any worker, is his own future with the company, his family's security, and the satisfaction he receives in doing his work. Given the right information, he has a chance to foresee his own future with the company and make plans to prepare himself for advancement with the thought in mind of staying with the company the rest of his useful life. Given the right information he can see his children educated and started out

in keeping with some of the other parts of a broad program to integrate foremen with management, the dissemination of such information insures the success of such a program from the start.

How should such information be disseminated? Some of it can be handled through supervisor conferences. Some should be provided through meetings with lecturers or guest speakers. Some of it can be presented in the employee magazine. Part of the job can be done with educational movies. One company

right in life . . . because his company provides the necessary economic security and a sufficiently high level of income for him to accomplish for his family what he wishes to do. Given the right information he can see more clearly that his responsibilities are not the result of management whims but directed by hard facts, that his function is not only fraught with responsibilities, but as a true part of top management he has an opportunity to assist in making those decisions which mean for the entire company a successful future.

THE END.



POWER plus **CONTROL**

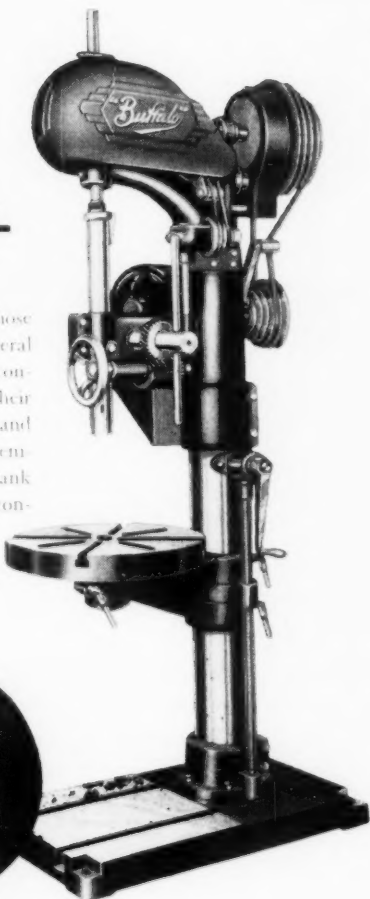
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"BUFFALO" NO. 21 DRILLS are the answer to those "pressure" schedules you often have to meet in general shop work. Rugged and powerful, they're capable of continuous, heavy work up to $1\frac{1}{2}$ " in cast iron. And their controls allow operators to "eat up the work" easily and accurately. Eight quickly changed speeds — four convenient feeds — direct or back-gear drive — simple crank controls for fast setup changes — automatic depth control—make this possible. IT MEANS YEARS OF LOWER COST DRILLING! Why not get the facts on this popular "Buffalo" machine? Simply write for BULLETIN 3746.

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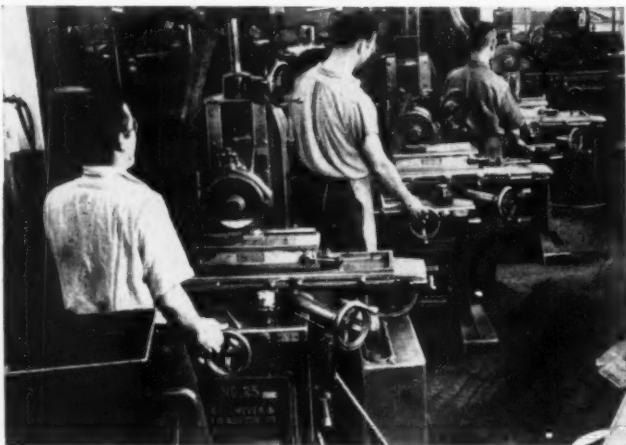
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Standard Pressed Steel Co., Jenkintown, Pa., use No. 25 Grand Rapids Hydraulic Feed Surface Grinders in making the tools and dies that produce Unbrako Socket Screw Products, Flexloc Self-Locking Nuts and Hallowell Shop Equipment.



You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
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To serve you—

Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Top Grinders, and Combination Tap and Drill Grinders.



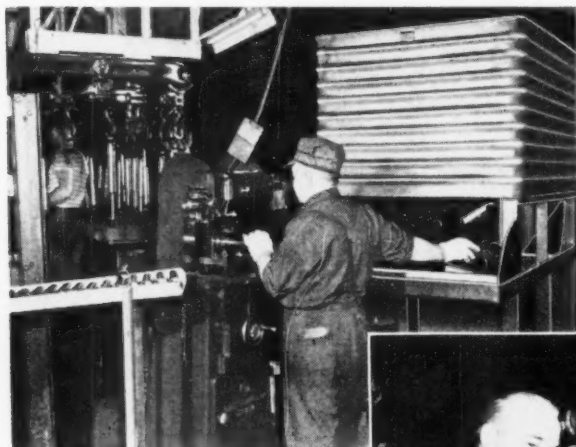
**GALLMEYER &
LIVINGSTON**
COMPANY

GRAND RAPIDS GRINDERS

405 Straight, S. W., Grand Rapids 4, Mich.

VIEWS . . . *from here and there . . .*

Cost of an operation in the production of hydraulic shock absorbers was reduced 22% through use of a Monroe drop bottom skid box. Shown is the stamping of dust shields. The gravity feed drop bottom skid box brings small parts to an easily accessible working level. Certainly saves a lot of bending.



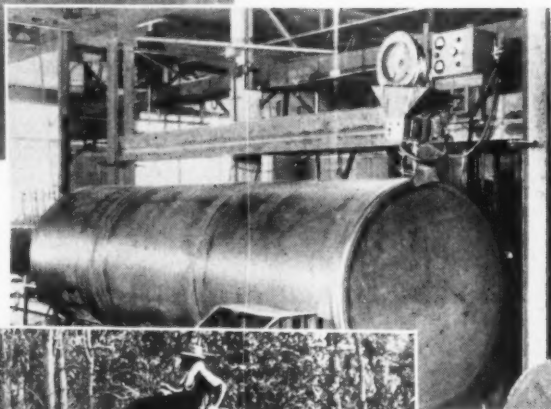
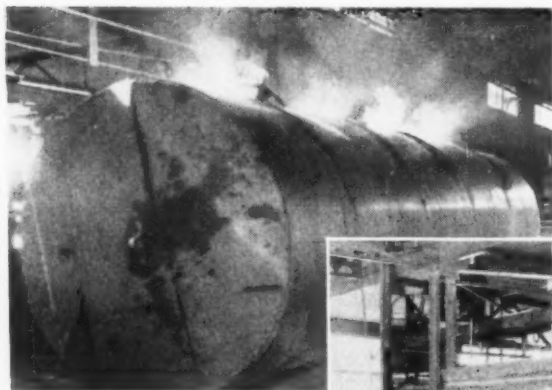
Arthur T. Dalton, Chicago Wheel & Mfg. Co., appears on ABC's WENR-TV television show, "Our Gal Toni". The program features the Handee Tool and Chicago mounted wheels in action.



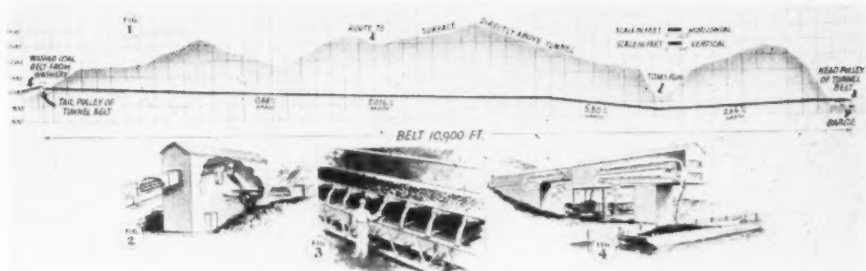
Special pick-up made by Sikorsky Aircraft Co. at the Torrington Mfg. Co. of a rush job. Job was an air impeller. To get fast delivery Sikorsky sent a helicopter to make the pick-up.

One "hidden-arc" automatic arc welding machine at Niles Steel Tank Company, Niles, Mich., does the work of four hand welding machines on 5000-gallon oil storage tanks.

"Lincolnweld", manufactured by The Lincoln Electric Co., Cleveland, is mounted on a 22-foot adjustable beam and welds the circumferential seams as the tank is rotated. Unit moves to the new position when one weld is completed.

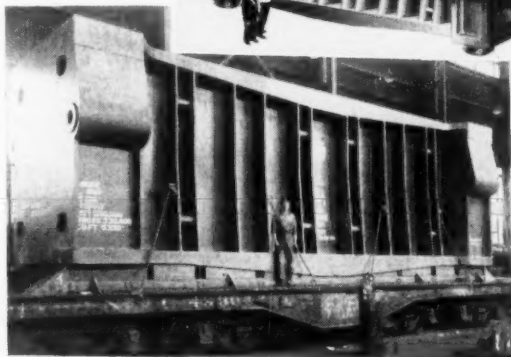
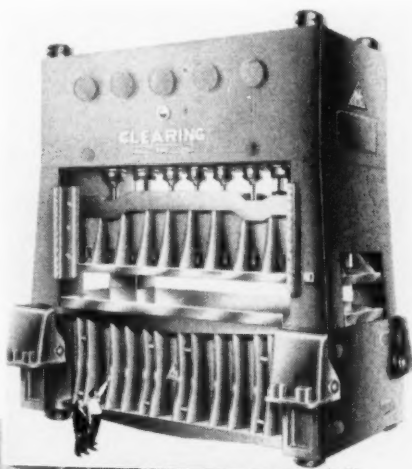


In the jungles of Siam, a fleet of modern White Super Power trucks are teaming up with those great beasts of burden, the elephants, in getting out the huge teakwood logs. Formerly the logs were hauled at elephant pace from jungle to mill, but today the East Asiatic Company, Ltd. uses the pachyderms to move the logs only to the clearing points, where they hoist them aboard White tractor-semitrailer units.



Artist's conception of profile of world's longest single unit conveyor belt, just installed at the Weirton mine of Weirton Steel Co. by The Goodyear Tire & Rubber Co. The belt is 10,900 feet long and 30 inches wide and will deliver 250 tons of coal per hour at a speed of 300 feet per minute.

The largest forming press of its type ever built. It weighs $1\frac{1}{2}$ million pounds and is 38 feet long. The bed is 440 inches long and weighs 175 tons and can receive dies which are 84 x 350 inches. A 200 hp motor, working through gears, will force the slide downward with a maximum pressure of 3,850 tons. If the entire bed were used, this would mean 250 lbs. for each square inch of the bed. The machine was made by the Clearing Machine Corp., Chicago, for a concern in France.



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save money in your TOOL ROOM



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ABRASIVES

*Making better products to
make other products better*



NORTON COMPANY, WORCESTER 6, MASS. Wareh

Use- There's a Cost-Cutting Wheel for Every Tool Room Job

32 ALUNDUM Abrasive —

This sensational abrasive — new and exclusively Norton — is making outstanding records everywhere. In thousands of tool rooms they are finding that "32" wheels can make substantial savings on all types of sharpening operations on high speed steels. Its unique crystal structure gives grains that are sharper — they penetrate sensitive high speed steels more easily, cutting faster and cooler.

38 ALUNDUM Abrasive —

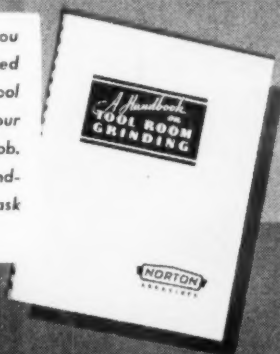
The original white abrasive, "38" has been a tool room favorite for forty years and is still popular with many tool grinders. It is the recommended abrasive for sharpening jobs where feeds are very light.

57 ALUNDUM Abrasive —

One of the newer Norton abrasives, "57" combines a fast cutting action with great toughness. Thus it is widely used for offhand tool grinding operations. Its slightly lower price also makes it popular for precision sharpening jobs in shops where the first cost of the wheel is given major consideration.

W-1282

It's really no trick to save money in your tool room if you have the right Norton wheels — wheels carefully selected to meet the exact requirements of each of your tool grinding jobs. Your Norton abrasive engineer or your Norton distributor will be glad to help in that selection job. You'll find a lot of helpful information in the Norton handbook on tool room grinding. Send for a copy — just ask for Form 835-D2.



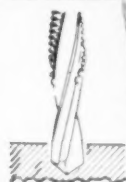
s in Five Cities

Distributors in All Principal Cities

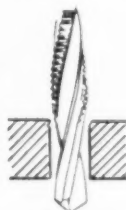
DRILL and TAP IN ONE OPERATION

SUBLAND DESIGN NOW MAKES IT POSSIBLE

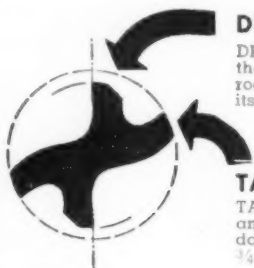
*** At last it has been done—a tool that combines these two jobs. Mohawks refinement of the subland design means short cuts that have been mechanics' dreams and engineers' ambitions for years.



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TAP

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DRILL**



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COUNTER
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MOHAWK TOOL COMPANY • 21641 Dequindre • Hazel Park, Mich.

Modern Tools in action

POWER TOOL SAVES 1/3 TO 4/5 IN FABRICATION OF METAL PRODUCTS

By A. G. Ringer, Application Engineer
Portable Power Tool Division, Ingersoll-Rand Company

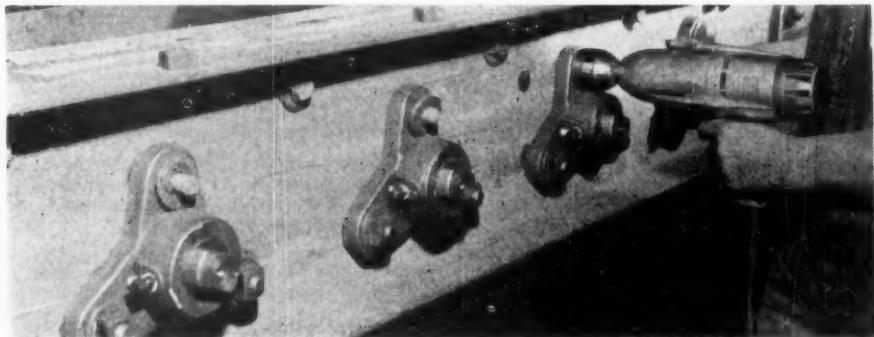
Metalworking involves a variety of assembly operations. Drilling, reaming, tapping, nut-running and screw-driving are a few of the jobs performed at some time or other in the manufacture of assembled metal products, equipment and machinery. For many years, the work was moved from one machine to another for each of these operations, often necessitating the construction of work jigs to hold the product at the machine. This was not only a troublesome and cumbersome procedure, but increased costs.

With the recent development of an all-purpose portable power tool, developed by the Ingersoll-Rand Co., N. Y., the trend is to take the tool to

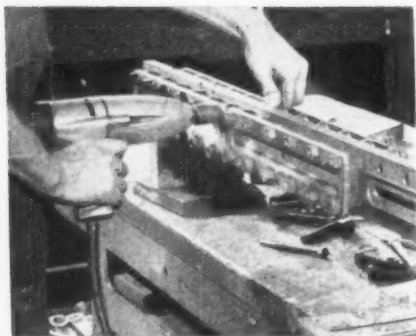
the work, rather than the work to the tool. Time and costs are saved, (1) in the speed with which the operation is accomplished, (2) in the elimination of work jigs, and (3) in the all-purpose feature of the tool, which permits a variety of operations. With standard accessories, the tool will tap; ream; drill steel, masonry or wood; run wire brushes; do hole saw work; apply and remove nuts, studs and all types of machine and wood screws; and extract broken cap screws and studs.

At the plant of a materials handling manufacturer, the tool is being used to run nuts and studs on ash gates. Here the shop foreman estimates that the use of the electric impact tool increases

Applying 80 square nuts in the assembly of an ash gate is done in only $\frac{2}{3}$ of the usual time with the Ingersoll-Rand electric Impacttool. At one plant, the foreman estimates that use of the tool increases shop capacity by $\frac{1}{3}$ by moving jobs through faster. In addition, the tool, with appropriate attachments, is used for tapping and reaming and for studding the cylinders of the ash gate. It is estimated that at least 75% of the time is saved in stud-driving. Studs can be applied as fast as a co-worker can set them.



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shop capacity by one-third, by moving jobs through faster, figure 1. The assembly requires the application of approximately 80 $\frac{3}{4}$ " square head nuts to a gate. With the previous hand wrench method, it required 2½ days to assemble five gates. The wrench often slipped as the nuts were drawn tight, necessitating several attempts to tighten a single nut.

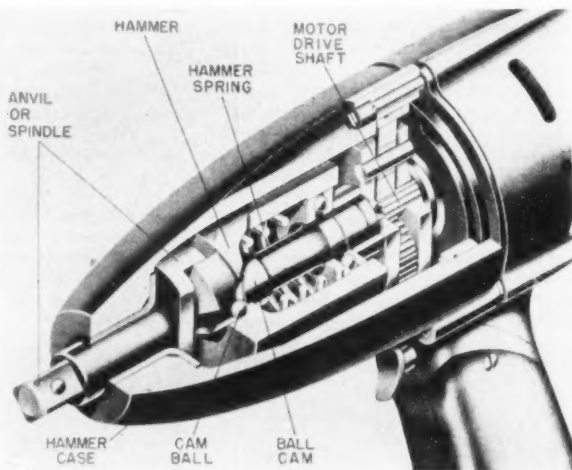
Using the electric tool to run 7/16" hex nuts on liquid level gauges. Here is a substitution of power tools for hand work which increased production nearly 50%.

With the electric impact tool, they cut assembly time to about 1¾ days to every five gates.

Another time-saving application in the metalworking field is in the plant of a vise manufacturer, who has a fabrication job involving the attaching of a large spring to a vise assembly by means of two $\frac{3}{8}$ " slotted screws. Using hand screw driver, 260 assemblies were completed per day. The electric impact tool increases production 54%, stepping it up to 400 assemblies per day.

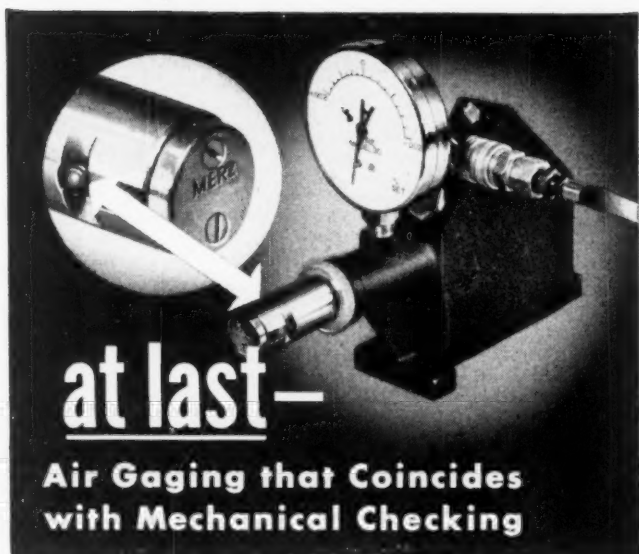
In another plant, the shop of a gas company, hand tools were used to roll $\frac{3}{4}$ " boiler tubes. The job took 80 hours to complete. When the shop installed the electric impact tool, with a special tube rolling attachment, the job was cut

Cut-away view of the electric Impacttool shows how the impact mechanism works. With the paws of the hammer and anvil in contact, as shown, the ball cam, hammer, and anvil, which can be called the spindle, rotate as a unit and the impact tool performs just as any conventional electric drill. When the resistance on the anvil is greater than the initial pressure of the hammer spring, the anvil remains stationary and the rotation of the ball cam causes the cam balls to roll up the cam grooves, pulling the hammer back over the ball cam and compressing the hammer spring. When the hammer is drawn back far enough, the paws of the anvil and hammer disengage and the hammer jaws slip over the top of the anvil jaws. The power stored in the compressor hammer spring now pushes the hammer forward towards its original position with respect to the ball cam. As the cam balls reach the lower part in the cam track, the hammer has attained maximum accelera-



tion and the hammer jaws deliver a powerful "rotary" impact to the anvil jaws. The tool delivers 1900 rotary impacts per minute to the work whenever resistance is met. This principle of compressing a rugged hammer spring and suddenly releasing the energy to strike a rotary blow results in greater turning effort than by any other known method.

the button does it



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the first time ever—you can have all the speed and ease of air gaging with precision accuracy that equals or excels mechanical checking. Now you can place air gages and mechanical gages side-by-side on your production lines—and get identical readings, every time! Let your Merz gaging specialist give you a demonstration—in *your own plant, on your own work*. Write today!

MERZ ENGINEERING COMPANY
Indianapolis 7, Indiana



to 16 man hours—a saving of 4/5 of the time ordinarily required.

In a general machine shop, the electric impact tool was put on the job of bolting up high pressure liquid level gauges, with a step-up of almost 50% in production, and a saving of about 47% in overall assembly time, figure 2. On another job in the same plant, the electric impact tool, with 5/16" tap, saves an estimated 50% of the time by eliminating jig construction in tapping the gallow's frame of a full-fashioned knitting machine.

In addition to versatility, another factor of the tool which contributes to production time is the "extra" power delivered to the work whenever it is needed. An outgrowth of the air-operated impact tool, the electric Impactool, originated by Ingersoll-Rand, provides a powerful turning effect with little effort. The tool operates as any con-

ventional electric tool until resistance to turning is met. Then the impact mechanism automatically starts to operate and delivers 1900 rotary blows per minute to the work. Under these powerful hammer blows, even frozen or rusted nuts can be removed in a few seconds. The principle of compressing a rugged hammer spring and suddenly releasing this energy to strike a rotary blow results in a greater turning effort than any other known method. As the tool is designed to deliver rotary impacts to the work without torque reaction to the operator, worker fatigue is reduced while production is increased.

Tools are equipped with universal motors and are available for 110 volt or 220 volt AC-DC current. They operate on 25-40-50 or 60 cycle frequency. This makes the tool applicable to electric conditions found almost anywhere in the world.

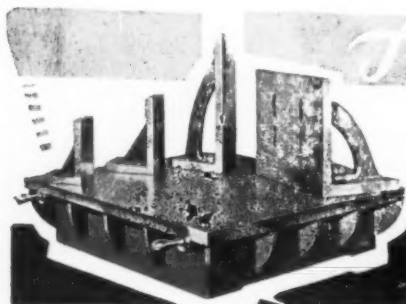
TURNING AND HOBBING BULL GEARS

In a modern turbine-driven ship the biggest and heaviest single unit of its machinery, the bull gear, is also just about the most microscopically accurate thing aboard. Although weight of the two gears and the shaft shown being machined at Westinghouse's Sunnyvale, Calif. plant is 51,200 pounds, tolerances for the operation must be held to as close as 0.0003 inches. The two wheels are welded together on a shaft to form the final stage of a gear train that reduces the 6000 rpm of a 7500 horsepower turbine to the approximately 100 rpm required in the propeller drive. Diameter of each bull-wheel is 146.392 inches.

The two bull-gear wheels have opposite

helixes, each containing 693 teeth with a diametral pitch of five. The two helixes must intersect at an hypothetical line exactly midway between the two inner rims. Hubs of the gear are forged steel, sides are of steel plate, and the rims and shaft are high-carbon-steel forgings.

The wheels are turned on a big lathe as shown in Fig. 1. This consists of four major operations: for the wheel diameters, faces of rims, beveled corners, and wheel shoulders or "dowels." Accuracy surpasses that found in a fine watch. For any of these surfaces, the maximum "indicator runout," the amount that dimensions may vary from the computed figures, is less than three ten-thousandths



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Production Curves**



This new, more powerful Buckeye Air Sander is equally adaptable to medium-duty sanding or light-duty cup wheel grinding.

The **BUCKEYE** **STREAM POWER** AIR SANDER

• The new Buckeye Air Sander is one of many Buckeye Air Tools used by Advance Auto Body Works in the manufacture of truck bodies and tank and trailer units for the petroleum and motor transportation industries. On fabrication work, weld removal and tank and body finishing, Buckeye Air Tools have reduced maintenance costs, tool down time and lost man-hours

... have helped maintain a higher rate of productivity at this Los Angeles plant.

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151

of an inch. The shaft is supported on steady rests and lathe centers.

Great care is taken to make sure that the big wheels and their shaft are properly aligned before machining. The shaft is turned true to ensure that the wheels will turn in the exact vertical plane of the shaft journals. Prior to the lathe machining, the wheel has been completely welded, normalized, and shrunk on its shaft.

Hobbing of the teeth had been completed on one wheel and was just starting on the second when the picture of Fig. 2 was taken. Note the square "target patches" on both wheel rims, just to the right of the operator. A thin locating line runs through these patches and provides reference points for lining up the helixes.

Hobbing is done by a rotary multi-

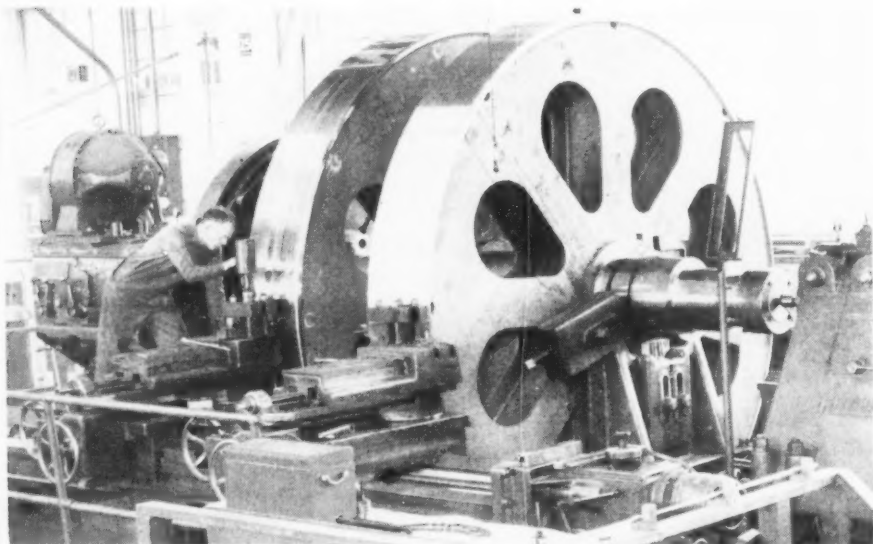


Fig. 1. Wheels for ship-propulsion bull gears must be accurately aligned and machined to tolerances as close as three ten-thousandths of an inch. Here the final stage of a lathe operation is shown. A machinist is inscribing a "target patch" on the wheels. This is to indicate the location of a line only 0.003 inches wide that is used for lining up the helixes in the hobbing that follows.

MACHINISTS—TOOL AND DIE MEN—SHEET METAL WORKERS—ETC.

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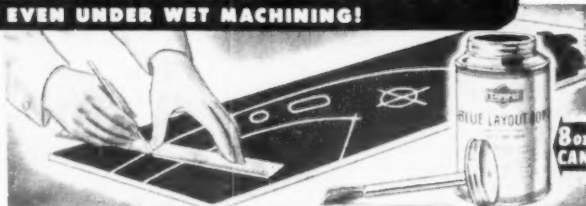
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These Adapters allow for adjustment of tool up or down in any spindle and are commonly used in multiple spindle operations. Adjustment is made by a nut on National Acme threads. Positive drive is through a Woodruff Key — hold back friction is secured with an Allen Set Screw.

Made of selected material, properly heat treated and accurately ground. Small diameter of nut allows use on spindles with close centers. Comprehensive range of sizes to fit Morse Taper holes 1 to 4 — Adapter sizes $\frac{3}{4}$ " to $1\frac{7}{8}$ ".

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THE J. C. **GLENZER** CO. Inc.

1546 E. NINE MILE ROAD, DETROIT 20, MICH.

pointed tool not unlike a pine cone in appearance shown at the extreme lift of the lower wheel. It takes 12 minutes for the wheel to revolve and with each revolution the hob advances into fresh metal. Both a rough cut and a finish cut are made for each wheel. A rough cut takes about 90 hours per wheel; a finish cut, 120 hours. Once the finish cut is started, the hobbing cannot be stopped until completed. Accordingly, hobbing machines are equipped with battery

power that switches on instantly in case of power failure. The hobbing room and lubricating oil are kept at a constant temperature of 78 to 80 degrees F to limit temperature changes in the wheel during the operation that would seriously affect accuracy of the machining.

When completed, this gear will become part of a complete modified C-3 type turbine power unit which the plant is building for a large Great Lakes ore carrier.

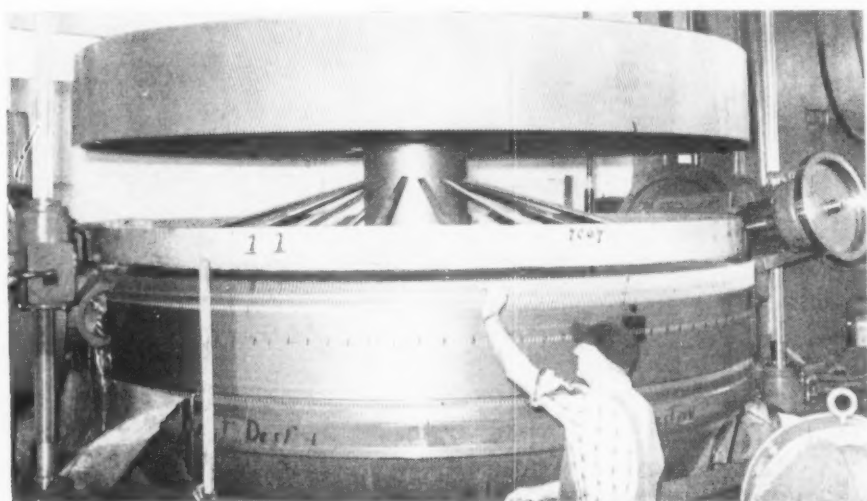


Fig. 2. Hobbing of large bull gears for ship propulsion must be carried on with extreme accuracy. In this illustration showing construction of bull gear, teeth are completed on the upper wheel and hobbing has just been started on the lower wheel.

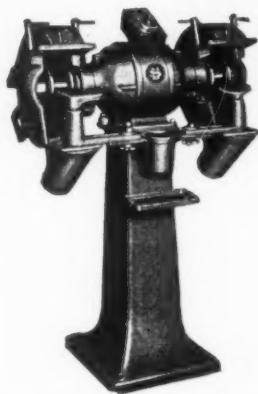


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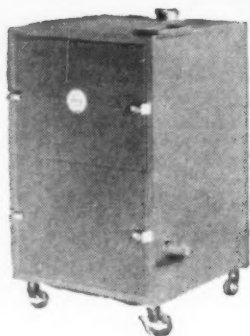
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EASY TO SOLVE



"The next card I turn over will be the card you selected." (This is an old one with variations that we'll explain if you write us. It's free, of course.)



TORIT DUST COLLECTORS *in mobile units*

When lathes, grinders, etc., are used intermittently, one Torit Dust Collector can often be used. For this service we offer cabinets mounted on casters, and equipped with flexible suction tube assemblies.

*Dust problems are easy to solve
when you use*

TORIT DUST COLLECTORS

Torit Dust Collectors are self-contained units, compactly designed to fit into your production setup. They can be placed almost anywhere, and usually require only a few feet of piping.

Torit Dust Collectors run only when the machine is operating, to minimize power consumption. The filtered air is recirculated into the room so no outside vents are necessary.

Torit Dust Collectors are stocked for immediate delivery. If you will outline your dust problem, our engineers will be glad to suggest types and sizes, and quote figures.

TORIT

Manufacturing Co.

303 Walnut St., St. Paul 2, Minn.

P.S. Ask for latest Torit catalog.

News of the industry.....

SELL-OUT PREDICTED FOR TOOL SHOW

Promising to be one of the largest and most successful shows of the year, the Industrial Cost Cutting Exposition has already announced the names of over 260 manufacturers who will be exhibiting their machinery, equipment and related products in Philadelphia from April 10-14th. The exposition is sponsored by the American Society of Tool Engineers.

Filling Convention Hall during those days will be the top engineers, production managers and purchasing agents of thousands of companies throughout the country. Those men will want to know what does what, and how they can use it. On hand to aid these men will be engineering specialists, supplied by the exhibiting manufacturers, to show the inquiring guest how he might utilize that particular item to better his company's production standards. The man who walks in with a briefcase full of questions will undoubtedly leave with a noggin full of answers. Every conceivable product that aids production and reduces expense will be on exhibit to give the visiting executives ideas in planning improved products at lesser cost.

With the difference between profit and loss for a year's output balancing upon a fraction of a cent per unit, today's manufacturer can well afford the time to find out how his machines can be made to operate 1% more efficiently, or how plant maintenance costs can be reduced a few cents per thousand square feet, or what a conveyor system would mean in savings in handling costs. All these answers, and a few hundred more, will be found there, for space has been rented to manufacturers of everything from A-brasives to Z-yglo inspection methods.

50th YEAR AS ALLOY MANUFACTURER

With the advent of 1950, Driver-Harris Company, of Harrison, N. J., completes 50 years in business. Manufacturers of special nickel-chrome alloys for electrical, mechanical and chemical uses, the company was incorporated December 23rd, 1899, and started business in small rented quarters in Newark, N. J., under the management of Frank L. Driver, Sr.

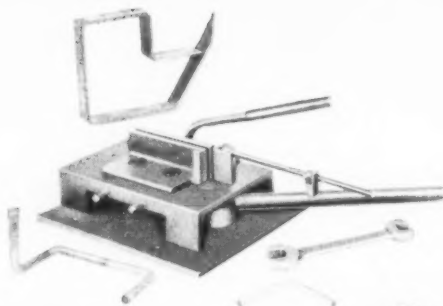
At the time the company was started, the use of alloys for electrical resistance and many other purposes was practically unknown in this country, and the early days of the company were devoted to pioneering, with the object of manufacturing and fabricating alloys for special uses.

In 1905, experimentation centered upon nickel-chromium compounds, and after several years of research and development, products were perfected for commercial use. Today, "Nichrome" — the trade mark adopted for this group of Driver-Harris alloys — has become well-known in electrical heating.

Today, Driver-Harris manufactures over 80 different alloys to meet the needs of the electrical, electronic and heat-treating fields. Outside of the United States, it operates plants in England, Ireland, France and Italy.

The Lincoln Electric Co. of Cleveland has established a welder parts exchange plan by which old parts may be traded in for factory wound stators, armatures and certain control parts. Standard prices in effect include trade-in allowance which reduces the cost for these production line

WHITNEY METAL TOOL COMPANY 39 YEARS EXPERIENCE



No. 52

WHITNEY-JENSEN No. 52 BENDER

An easily operated, ruggedly built bender that always produces good square bends in round solid bars, flats, and angles. Patented adjustment compensates for thickness of metal. An adjustable gauge — for duplicating bends — is provided.

Capacity — mild steel —

1/2" rounds; 1/4" x 2" flats; 1/4" x 2" angles

Other Whitney Benders also available

WHITNEY METAL TOOL COMPANY
115 FORBES STREET, ROCKFORD, ILLINOIS

and hydraulic power units. All manufacturing and selling operations of the line are being transferred immediately to Boston, with no interruption in acceptance and delivery of orders. Gerotor is retaining the sales of hydraulic pumps and fluid motors.

The acquired line will be marketed through the present Gerotor dealer organization and the former trade name will continue to identify the Rivett line. John A. Marsh, formerly the special sales representative for Gerotor is the new sales manager for valve and cylinder division of Rivett.

The merger of the American Air Filter Co., of Louisville, manufacturers of filters and dust collectors and the Herman Nelson Corp. (Moline, Ill.), heating and ventilating equipment, became effective January 6, 1950. The Nelson Corp. will now operate as the Herman Nelson Division of American Air Filter Co., and

will continue to operate in Moline. W. G. Frank, executive vice president, and Richard H. Nelson have been elected directors of the combined firm.

Stover Lock Nut & Machinery Corp., Easton, Pa., have purchased a new and larger plant at Hilton and Holly Sts. of the same city. All operations are now being conducted at the new plant.

factory parts below the cost of individual local rewinding and repairing.

This service is available through the 146 Lincoln authorized field service shops in 44 different states. Factory trained men are available at each of these shops for the installation of exchange parts at standard prices.

Rivett Lathe & Grinder of Boston has purchased the entire line of Gerotor May Corp. air and hydraulic cylinders, valves

The Riverside Metal Co. of New Jersey has just completed expansion of its mill

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**REPLACE THEM WITH
THE WORLD'S MOST
DEPENDABLE PUNCHES
IN ONLY A FEW SECONDS!**

PIVOT* PUNCHES

PRESSURE CAST WHIPSLEEVE SUPPORTS

STRAIGHT GROUND HIGH SPEED STEEL

Straight ground parallel to the axis of the punch to resist wear, assure easier stripping, minimize galling.

Whipsleeve support, pressure cast at critical point, eliminates vibration, whipping or shifting.

Greater accuracy, greater ratio — punchability, longer punch life and lower production costs! Replace many drilling operations.

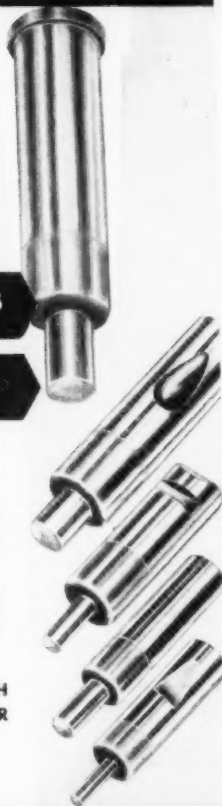
**AVAILABLE IN ANY STYLE OF PUNCH
TO FIT ANY TYPE OF RETAINER
AT COMMERCIAL PRICES**

Write for catalog, Dept. M

*Reg. U. S. Pat. Off.



PIVOT PUNCH AND DIE CORPORATION
373 OLD NIAGARA FALLS BLVD. NORTH TONAWANDA, N. Y.



does not apply to other products of the company.

Hamilton Pump Company has recently combined two existing plants under one roof. All production is now concentrated in reconstructed plant quarters located at 39th St. and A.V. R.R., Pittsburgh 1, Pa., where much more floor area and greatly improved facilities will benefit manufacture of machinery for wet grinding strip and sheet. The company has equipped itself for building larger steel mill equipment and the handling of heavier machine production in general.

On December 1, 1949, the company also relocated in enlarged office buildings at the new address, 32 - 39th St., Pittsburgh 1, Pa.

Employees under 18 will not be permitted to operate certain power-driven metal-working machines cited as hazardous in a new order

facilities so that it can now supply a greater variety of sizes in nickel-silver and phosphor-bronze alloy wire and rod. The new facilities include greater capacity casting equipment, annealing furnaces, material handling, wire drawing and roll milling equipment.

Effective immediately, Scully-Jones style B tap chucks and drill drivers are available to all jobbers, mill supply houses and other resale outlets handling lines of drills and taps. The new policy

proposed by Secretary of Labor, Maurice J. Tobin, pursuant to the child labor provisions of the Fair Labor Standards Act. Machines declared hazardous in the proposed regulation known as Hazardous Occupations Order No. 8, include rolls for bending or reducing the thickness of metal, all punching and pressing machines such as punch presses, brakes for bending sheet metals, power and drop hammers, and all shears used for cutting metals. In announcing the proposed order, Secretary Tobin cited the high percentage of serious injuries and



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with the
**OVERLOAD
INDICATOR**

Look for the **RED BAND**

You no longer have to guess whether you are overloading your live center thrust bearings if you use **MOTOR TOOL LIVE CENTERS**. When the load is too great the **RED BAND** around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the **RED BAND** is visible you are running **COOL** and **SAFE**.

Send for

NEW descriptive folder . . . and verified case histories of how **MOTOR TOOL LIVE CENTERS** have out-performed and outlasted **ALL** other centers on exceedingly tough, continuous-run jobs.

MOTOR TOOL MFG. CO.
8663 DAYTON ST. DETROIT 10, MICH. PHONE OR-0349

Make it a Rule
to Call Motor Tool

permanent disabilities occurring in the operation of these machines—much higher than the average for all manufacturing injuries.

Also proposed is an amendment to Order No. 7, prohibiting the employment of minors under 18 on manlifts—endless belts equipped with platforms operating vertically through holes in the floors of a building. Outlawed in some locations as hazardous for all workers, these manlifts are primarily used in public parking garages, grain elevators, flour mills and the like. No public hearings will be held on these proposals but 30 days will be allowed during which interested persons may file objections to the orders.

Since the time and facilities of Saval, Inc. are now required for the production of aircraft and related units, L. S. Barksdale, President of Saval, has formed a new company to produce their universally accepted "Shear-Seal" valves for industrial applications.

This new firm, known as Barksdale Valves, and located at 4905 Santa Fe, Los Angeles, has separate facilities to produce non-airborne valves under an exclusive license arrangement with Saval.

**AUTOMATIC
CHUCKING AND INDEXING
FIXTURE**

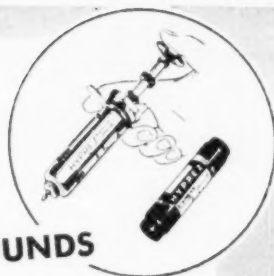


- 1.—1800 light cuts per hour.
- 2.—Either horizontal or vertical position.
- 3.—Collets changed instantly.
- 4.—Automatically knocks piece out.
- Model D—Ratchet indexing only—1" cap.
- Model E—Both degree and ratchet indexing
—Capacity up to 1"
- Model F—Both degree and ratchet indexing
—Capacity up to 2 1/4"

Write for Folders

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**Only HYPREZ Can
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LAMINATED LAPPING STICK**

Available in 6" length, 1/8" to 3/16" square,
and rectangular. Any size may be rounded or
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For free demonstration or Hyprez lapping stick write Dept. B-350.

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HIGHER CORPORATION OR CONSUMER TAXES?

Recently it was reported that "the biggest single worry now plaguing administration economists" is the increasing refusal of people to risk new savings in helping expand industry and improve its products and services.

It was even hinted that some top union economists also are worried about this and seriously considered coming out soon for cutting instead of raising corporate taxes.

But now plans are afoot from many similar sources to lift some excise taxes off individual citizens, and then add that amount to the taxes which corporations are already paying.

Will lifting these taxes off consumers and putting them on corporations really mean less taxes for you and other individual citizens? The fallacy of this "economy" is obvious.

Those individual citizens, who might thus be spared some **direct** taxes, are the very same individual citizens who are the customers, the employees, and the owners of these corporations. They would then be paying **indirectly** the very taxes which supposedly had just been shifted off their shoulders. The act of apparently relieving individuals of taxes by putting those taxes on corporations is simply economic bunk.

The government is, of course, going to have its taxes.

Any taxes not collected directly and visibly are going to be collected indirectly and invisibly.

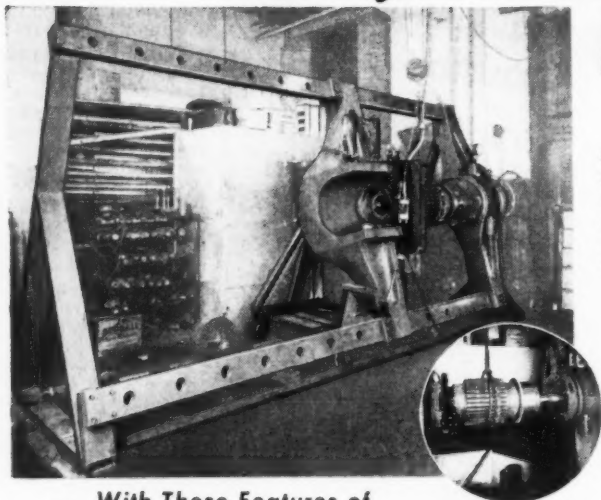
It is especially wrong for anyone to think that these taxes can be shifted over so that they come entirely out of the income being received on savings.

Let's not be fooled by the idea that citizens can escape taxes by having corporations pay them.

(From General Electric "Commentator", Feb. 3, 1950).

For Fast, Efficient Pressing,
Bending, Forming, Straightening . . .

New *Rodgers* FORCING PRESSES



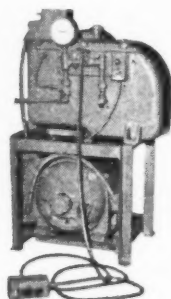
Rodgers 300 Ton, 75° Inclined, Stationary Forcing Press, one of many in the complete Rodgers line. In the application shown, the press is being used efficiently to press an armature shaft.

. . . With These Features of Construction and Operation

SEPARATE PUMPING UNITS—Choose from individual hand-operated or power-driven pumps to operate any model Rodgers Forcing Press. **REMOTE CONTROL OF POWER PUMPS**—Operator can control press from any desired position. **REMOVABLE HYDRAULIC CYLINDER**—Cylinder is easily removed from head member to permit servicing or use for other power applications. **INDIVIDUAL FRAME UNITS**—Tracks, tension bars, abutment member and head member are all separate units to facilitate handling and erection of press. **EXPERTLY ENGINEERED AND CONSTRUCTED**—All units of Rodgers Forcing Presses are made strong, durable and dependable to give years of reliable service.

. . . In These Types and Sizes

Rodgers Versatile Forcing Presses are available in portable or stationary models—horizontal, vertical, 75° or 90° inclined—100 to 600 tons—with hand-operated or power-driven pumps. In this broad selection, you'll find the ideal press to meet your requirements.



Separate Power Pump

Select your press operating unit from hand-driven pumps or power-driven pumps. Shown is a Rodgers 2-cylinder Power Pump with remote control.

Send for New Catalog

For full details and specifications on the complete line of Rodgers Forcing Presses send for Catalog 315.



Rodgers Hydraulic, Inc.

7453 Walker St., St. Louis Park, Minneapolis 16, Minn.

HYDRAULIC POWER EQUIPMENT

Available Literature

CATALOGS, BOOKS AND INDUSTRIAL FILMS

1. A complete guide, reference and price list for Carbide & Abrasive Production Tools illustrates burrs, hi-speed steel cutters, mandrels, mounted wheels, abrasive cartridges and polishing wheels. Featured in Catalog 20 is the new Roto-Master Carbide Grinder. **The Metal Removal Co.**, 1016 N. Ashland Ave., Chicago 22, Illinois.

2. **Folder No. 7-1** tells how to speed up production by giving multiple spindle range to single spindle presses and radial drills when using quick change chucks and collets. Pictures and specifications on 4 styles of quick change chucks illustrate use with drills, reamers, boring bars, core drills, taps and special tools. **Scully-Jones Co.**, 1907 S. Rockwell St., Chicago 8, Ill.

3. A useful chart presents information on all tungsten carbide manufacturers' grade recommendations for chip removal, wear and impact applications. Proper grades are indicated for chip removal on steel and non-ferrous materials for roughing cuts through precision boring. Chart was prepared as a result of a survey made by the Carbide Industry Standardization Committee. **Adamas Carbide Corp.**, Box 149, Harrison, N. J.

4. **Offset boring heads**, made in nine sizes, have minimized overhang and easily read calibrations. The boring bars go to the bottom of the dove-tail bearing to make short setup. Tension screws are on opposite sides and ends of block, so that all cutting strain is thrown against solid metal. **C. C. Craley Mfg. Co.**, Shillington, Pa.

5. **Standard hydraulic metalworking**

presses, series DF-10, 15 and 20, accomplish drawing, forming, straightening, bending, coining and other shop operations. Capacity of series, in above order, is 100, 150 and 200 tons. Presses in all series can be furnished with 1) single action normal speed, hand lever operated; 2) single action with cushion, normal speed, hand lever operated; 3) single action, high speed pushbutton operated; and 4) single action with cushion, high speed, push button operated. **Bulletin 749, Lake Erie Engineering Corp.**, 325 Woodward Ave., Buffalo 17, N. Y.

6. **Side milling cutters**, end mill cutters, keyseat cutters; face, shell, half-side, fluted mills; and carbide tipped, masonry, hard steel drills are illustrated and listed in catalog of carbide tipped cutting tools. Requests are invited for design and development for special tools. **Nelco Tools Co.**, Manchester, Conn.

7. **Ball bushings for linear motions** have raceway circuit for re-circulation of balls. One side of raceway carries load, giving low friction, alignment and prolonged lubrication. Bulletin shows arrangements and uses along with specifications. **Thomson Industries, Inc.**, Manhasset, N. Y.

8. **Thirty ton capacity punch presses**, trade named **Diamond Multi-Max**, have underneath double crank pull down drive and electrically operated clutch control. Machine will deliver up to 80 strokes per minute. Construction consists entirely of welded steel castings and plate. **Diamond Machine Tool Co.**, 3429 E. Olympic Blvd., Los Angeles 23, Calif.

9. The "**Hobart Arc Welding News**" is a publication dealing with welding and is

AT LAST!!
DU-BITS PRE-FORMED HSS BITS
 SAVE 85% OF ORIGINAL PREPARATORY GRINDING TIME

Forty Years of Waste Grinding

THE MODERN DU-BIT SHAPE

WHY BUY SOMETHING YOU IMMEDIATELY GRIND AWAY

Why buy old style SQUARE bits and then PAY to have clearances ground? SAVE TIME AND GRINDING WHEELS by using DU-BITS. DU-BITS have LEAD AND POINT CLEARANCE ALREADY FORMED (both right and left hand). Made of SUPER HIGH SPEED STEEL with a minimum RC 66 hardness... DU-BITS fit standard holders. Furnished GROUND ONLY at this time - All standard sizes.

ORDER DU-BITS NOW - DIRECT FROM DEPT. 8

THE DOW MECHANICAL CORPORATION,
 THOMPSONVILLE,
 CONN.

pages. The Cincinnati Shaper Co., Cincinnati 25, O.

11. Safco 770, all purpose coolant base, has consistency of liquid paste. Combines in a single water soluble product the essential qualities of a grinding compound and a sulphurized cutting oil, is the claim of the manufacturer. Other characteristics; prevents wheel loading, reduces wheel dressing, prevents rusting and stays free from rancidity and odor. Full details can be found in bulletin. Swan-Finch Oil Corp., RCA Building West, New York, N. Y.

12. Catalog I-49 contains description and 48 pictures of the Landis 12". Type CH, universal hydraulic cylindrical grinders. Machine has micro-sphere wheel spindle bearings, eye level wheel feed, variable speed headstock, and swinging bracket internal fixture. Landis Tool Co., Waynesboro, Pa.

available to anyone interested in receiving information on what is being done with arc welding. The Hobart Brothers Co., Box TB-19, Troy, O.

10. The "Cincinnati Shaper Catalog No. N-5" reviews the company's line of shapers and the various jobs that can be done with the machines. Besides planing and shaping, angular work, internal shaping, contouring and duplicating are described with action pictures. Thirty-two

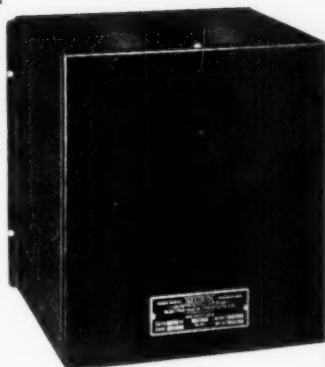
13. The electro-lok shield permits operator to clearly see work, and will not permit machine to be started without its being in position. The shield has 60 square inches of safety glass, which can be easily replaced when it becomes pitted. Shield is controlled by mercury switches. Designed for adaption to bench and pedestal grinders. Junkin Safety Appliance Co., 930 W. Hill St., Louisville, Ky.

14. A Supplement to the Handbook H28



NEUTROL
Magnetic
Chuck
Controls

**WHEREVER
MAGNETIC
CHUCKS
ARE
USED**



THE ELECTRO-MATIC RECTIFIER AND NEUTROL MAGNETIC CHUCK CONTROL ARE INDISPENSABLE FOR BETTER AND SAFER GRINDER PERFORMANCE

NEUTROL Magnetic Chuck Controls speedily release and demagnetize workpieces. With NEUTROL, there's no need to hammer or pry to release the work. This saves time and tempers—saves marred, distorted workpieces and prevents damaging of chuck faces. NEUTROL also protects chucks against harmful voltage surges.

ELECTRO-MATIC Rectifiers are sturdy, heavy duty, direct current supply units, engineered to "stand up" day-after-day in the hardest service. They are available in any desired voltage combination in capacities ranging from 50 to 20,000 watts.

NEUTROL and ELECTRO-MATIC Rectifiers can be installed easily on equipment already in use—or built into new machines before delivery if you so specify.

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The QUALITY NAME in Circular and Single Point Carbide-Tipped Cutting Tools

YOU can be assured of maximum accuracy and performance when you specify carbide metal-cutting tools bearing the Staples signature. Staples precision and painstaking methods of production maintain closer tolerances on tool size, straightness and surface finish.

For higher work output per tool and more work between tool grinds, put Staples Tools to work on your production. You'll find greater economy in the long run! There are more than 28,000 Staples Tools in stock for immediate shipment. A complete Staples Tool Catalog will be sent on request.

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Staples

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CARBIDE-TIPPED CUTTING TOOLS

A complete line of single and multiple point cutting tools—expansion reamers—form tools—centers—masonry drills—special tools

(1944). Screw-Thread Standards for Federal Services, has just been issued by the National Bureau of Standards and is available from the U. S. Government Printing Office. This publication makes effective a number of changes in American screw thread standards which have been adopted by the Interdepartmental Screw Thread Committee of the Federal Government since publication of the 1944 edition. 25c. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

15. The Mattison No. 24 rotary surface grinder, Hanchett type, has electrically controlled movements for minimum supervision. The grinding wheel can be fed down to the work manually or automatically and automatic throw-out halts feed when finished size of work has been reached. Bulletin No. 144-2RM gives full description. **Mattison Machine Works**, 545 Blackhawk Park Ave., Rockford, Ill.

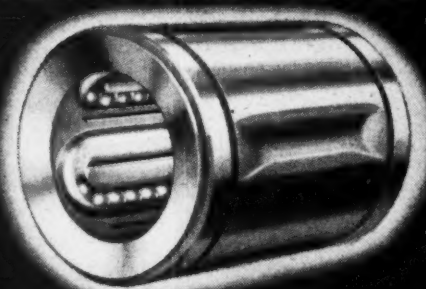
16. The Bellows Hydro-Check, an adjustable hydraulic resistance unit, sets up an opposed, steadying force to the forward movement of air powered devices. This reduces bounce and springiness in feeds. The Hydro-Check is adjustable and flexible. It may be set by the operator to suit the needs of the work, and at any given point. Diagrammatic drawings show models available and type of work done. **Bellows Co.**, 222 W. Market St., Akron 9, Ohio.

17. Block type tooling is versatile and accurate. With a succession of blocks inserted into a boring bar slot or series of slots, bores can be rough through finished bored, counterbored, faced or chamfered. Diametrically opposed cutters, predetermined in size, provide balanced cut. **Davis Boring Tool Div.**, Giddings and Lewis Machine Tool Co., 140 Doty St., Fond du Lac, Wis.

18. The P&W standard measuring machine consists of a master bar, measuring head. Electrolimit pressure tailstock

Announcing A New **LOW COST** Ball Bearing for You

LINEAR MOTIONS



THE
COMMERCIAL
GRADE
SERIES B

BALL BUSHING

Sliding linear motions are nearly always troublesome. Thousands of progressive engineers have solved this problem by application of the Precision Series A Ball Bushing.

The low-cost Commercial Grade Series B bearing is now added to the Ball Bushing line and offered to original equipment manufacturers. This ball bearing has been developed for support of linear motions in competitively priced, volume produced products where super precision is not essential. Alert designers can now make tremendous improvements in their products by using Ball Bushings on guide rods, reciprocating shafts, push-pull actions, or for support of any mechanism that is moved or shifted in a straight line.

Competition is returning. Up-to-date engineering can be important to you!

**LOW FRICTION • ELIMINATE BINDING AND
CHATTER • SOLVES SLIDING LUBRICATION PROBLEMS •
LASTING ALIGNMENT • LOW MAINTENANCE • LONG LIFE**

Dept. C THOMSON INDUSTRIES, INC. MANHASSET NEW YORK
PROGRESSIVE MANUFACTURERS USE BALL BUSHINGS - A MAJOR IMPROVEMENT AT A MINOR COST

and a rigid bed. Cylindrical objects can be checked for diameter, roundness, straightness and taper. Measurements are read to .00001" on the graduated scales. Machines come in standard sizes up to capacities of 80". **Pratt & Whitney, Div. of Niles-Bement-Pond Co., West Hartford 1, Conn.**

19. Unecda light is designed for inspectors, tool and die makers and other jobs requiring close observation. The light, mounted on a long, adjustable stem, is

capable of movement to the exact position of work. Separate attachments include caps or shields, mirror reflectors, and larger bulbs. Folder gives illustrations and nomenclature of parts. **Twentieth Century Mfg. Co., 3716 Montrose Ave., Chicago 18, Illinois.**

20. The Herzberg universal multiple drill is fully mechanical with positive gear drives to each spindle. The tapping heads, utilizing individual lead screw spindles, minimize operator responsibility and make it practically impossible to damage the spindles should a hole be overlooked. **Herzberg - Gruber Corp., Milwaukee 12, Wis.**

21. The "ESL Bibliography No. 4" is a comprehensive list of 114 books and periodical articles on all aspects of pallets, including the design and construction of different types, handling of various materials and present day applications. May

be purchased from the Engineering Societies Library, 29 W. 39th St., New York 18, N. Y. Price \$2.00.

22. Mounting bolt circular lists wide range of sizes and specifications on T-bolts, bolster bolts, nuts and washers, made to J.I.C. standards. **West Point Mfg. Co., 19625 Merriman Court, Farmington, Mich.**

23. Mead air power catalog lists 18 air cylinders, air presses, collet fixtures, work



✓ Small or Large
✓ Functional
or Ornamental

H & K PERFORATIONS

Will Improve Your Product or Process

Industrial Screens, H & K Perforations, are commonly specified for their bonus values in service life and greater accuracy of process. H & K Screens are available with tolerances as close as $\pm .0005''$ variation in hole diameters. Round holes available from .020" to 9" diameter—slots from .006" wide — also add

shapes, indented, lipped, burred, tapered, stabbed and other specials. Kind and temper of metal and sheet materials such as plastics, fabrikoids, etc., may be specified.

Ornamental Grilles are widely preferred for their distinctive high quality and low cost. There's a wealth of patterns to choose from.

Catalog No. 62 will tell you the "hole" story — write for it!



The
Harrington & King
PERFORATING CO.

5635 FILLMORE ST., CHICAGO 44, ILL.
114 LIBERTY ST., NEW YORK 6, N. Y.

feeders, impact hammers, valves and accessories in their line. 47 page booklet gives full description. **Mead Specialties Co.**, 4114 N. Knox Ave., Dept. YA-118, Chicago 18, Ill.

24. Shelving and storage units, including the Rotabin rotating units, are illustrated in use with various layouts of efficient storage operation. Straight steel shelving for industrial needs is also shown. **The Frick-Gallagher Mfg. Co.**, 406 Shubert Bldg., Philadelphia 2, Pa.

25. A new method of computing potential return on capital invested by metal working manufacturers in new machine tools is presented in the form of a booklet entitled "Computing Return on Invested Capital, A Study in Machine Tool Arithmetic." The method carries shop computations of annual savings effected by a new machine tool on through the additional computations dealing with depreciation and Federal income taxes, in order to arrive at estimated net return over a ten-year period, the probable profitable life of the new machine.

The back of the booklet consists of a work sheet upon which a machine tool salesman, after securing facts as to the increased productivity and the resultant savings which a machine tool may effect in a customer's plant, can then compute simply and rapidly the potential per cent of annual net return on the money to be invested in the new machine. **National Machine Tool Builders' Association**, 10525 Carnegie Ave., Cleveland 6, Ohio.

26. **Bulletin** presents a line of high speed inclinable presses. Featured is the Warco pneumatic clutch and brake. These open back presses range in sizes from capacities of 40 to 200 tons, with stroke lengths made to suit customer requirements. Specifications, sectional drawings and identifying parts lists are contained in

THE FIRST NEW IDEA IN DRILL JIG BUSHINGS...

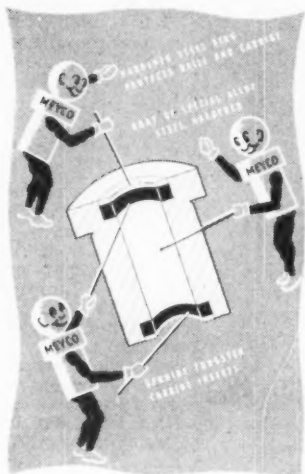


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HECTOR WAS A PUP!

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Carbide Inserted Bushings
SAVE money 7 ways:

Talk about "earning their keep," look at the ways Meyco Carbide Inserted Drill Jig Bushings will save production costs: (1) Last longer . . . with a life—in most cases—as long as solid carbide bushings at prices that come close to the prices of ordinary steel bushings; (2) Increased life for your drill jigs and fixtures; (3) Increased life for your drills and reamers; (4) Accuracy maintained for a LONG PERIOD of time; (5) Less non-productive machine time, less lost man hours, because bushings need not be changed as often; (6) Inspection time saved, because of greater accuracy for a longer time; and (7) Less waste due to spoilage, for the same reason. MOTORMAKER SAYS: "High-Speed steel bushings averaged ten days' life, MEYCO bushings, after three months' use, show no signs of wear."



For information and
prices write for Meyco
Bushing Catalog No. 16.



W. F. MEYERS CO., INC., BEDFORD, INDIANA

publications. The Federal Machine & Welder Co., Warren, Ohio.

27. Torkarm converts any drill press to a radial drill for most operations. Its light weight and flexibility speed up operations in drilling and tapping; its absorption of all torque produce better and more accurate jobs, with greater safety. Full details on the adaption of Torkarm are presented in bulletin. **Torkarm Corp.**, 2908 S. Emerson Ave., Minneapolis 8, Minn.

28. High speed synchronous generators for standby, portable and prime source power are shown in Bulletin GEA-5415. Along with illustrations, there are three typical installation case studies. Ratings from 12½ to 1250 k.v.a. and speeds from 514 to 1800 r.p.m. are covered. **General Electric Co.**, Schenectady, N.Y.

29. The Model 50 Cleveland universal high pressure hydraulic die casting machines can be furnished either with gooseneck or cold chamber. The hot metal end used for die casting aluminum, brass and magnesium alloys is removable and can quickly be replaced by an end for zinc, tin or lead alloys. Size of die plates are 22"x18" for both groups of metals. **Cleveland Automatic Machine Co.**, 4934 Beech St., Cincinnati 12, Ohio.

30. "Step Up Production" is a booklet on the mechanical application of coated abrasives for industrial grinding and

finishing by the 3M method. The booklet contains numerous examples of manufacturers who installed 3M equipment and what their results were. **Minnesota Mining and Manufacturing Co.**, 900 Fauquier Ave., St. Paul 6, Minn.

31. Descriptions of more than 200 research projects undertaken by the Armour Research Foundation of Illinois Institute of Technology during the fiscal year of 1948-1949 are reported upon in the Foundation's annual report. The non-

NEW "QUICK-LOCK" ADJUSTABLE ADAPTER ASSEMBLIES

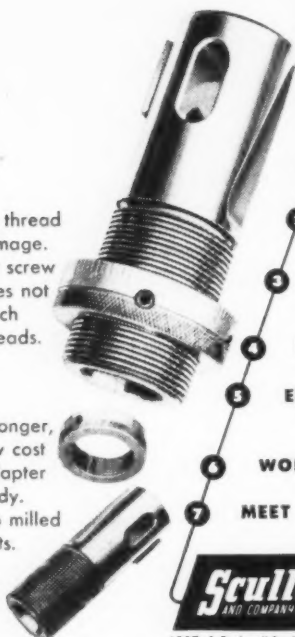
for multiple spindle machines

by **SJ** SCULLY-JONES

7
COST CUTTING
advantages!

No thread
damage.
Set screw
does not
touch
threads.

Stronger,
low cost
Adapter
body.
No milled
slots.



- 1 LOW INITIAL COST
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- 3 CUT DOWN YOUR REPLACEMENT PURCHASES
- 4 REDUCE YOUR REJECTS
- 5 END GUESSWORK ON FINE ADJUSTMENTS
- 6 WORK ON CLOSE CENTERS
- 7 MEET ALL YOUR REQUIREMENTS

Scully-Jones
AND COMPANY

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Containing Prices and Specifications

1907 S. Rockwell St., Chicago 8, Ill.

YOU GET LOW COST, FAST, ACCURATE PRODUCTION WITH OUR STANDARD AND SPECIAL TOOLS

profit organization, founded in 1936, follows research problems for the betterment and increase of industrial productivity. **Illinois Institute of Technology**, 3300 South Federal St., Chicago 16, Ill.

32. The entire line of **Duro** power tools, of saws, planers, lathes, drill presses, jointers and sanders are pictured and specified in folder type catalog. **Duro Metal Products Co.**, 2674 N. Kildare Ave., Chicago 39, Ill.

33. A 136 page catalog, fully illustrated,

list all Continental standard cutting tools (carbide and high speed steel), shows many special tools and contains a complete broach and fixture section. Useful information and charts used by the metalworking industries are included for reference. **Ex-Cell-O Corp.**, Detroit 32, Mich.

34. Catalog No. 140 introduces a new composition sealed bearing design. It also covers a line of radial, thrust and combined radial/thrust bearings, ranging from close tolerances to inexpensive pressed steel bearings of unground type. **Nice Ball Bearing Co.**, 2921 Hunting-ton Park Ave., Philadelphia, Pa.

35. Catalog No. 71 illustrates many new and several redesigned buffers and grinders, as well as many of the company's standard machines. **Hisey-Wolf Machine Co.**, Cincinnati 8, Ohio.

36. A reference book and catalog

describes performance data, specifications and illustrations of **Stow** flexible shaft machines and accessories. Group includes tool shafts, power drive shafts and drill shafts. **Stow Manufacturing Co.**, Binghamton, N. Y.

37. The **Koldweld** process of welding aluminum, copper and other non-ferrous metals, which requires inexpensive equipment and less manual labor, is described by the products possible to produce and the equipment needed. No heat

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in this Important New Field**

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At our risk, use this book 7 days. If not fully satisfied return it and your money will be refunded without question.

I may return book after 7 days if not satisfied

Address

City State

38. "How to Set Up and Conduct a Safety Rx Program" contains useful information on planning and establishing eye safety programs. Also suggested methods for obtaining professional services to implement the program are included. **American Optical Co.**, Southbridge, Mass.

39. Oilless Bearings. A new engineering

40. Of interest to those who have lifting and transporting of heavy tools or materials to contend with, is the Hamilton Bulletin P-50. Described in this bulletin is the Portelelevator, a portable elevating table. The table has three table surfaces, with the top surface adjustable in height to 39-42" (depending on model). Table

comes equipped with a floor lock for stationing and special attachments include a conveyor top and a guard rail. **Hamilton Tool Co., 826 S. Ninth St., Hamilton, O.**

41. Catalog No. 57 is designed to help the user make quick, accurate selection of the correct internal grinding spindle for any given application. A large number of spindles are indexed by type of spindle, make of grinding machine or by style numbers, for quick location of proper



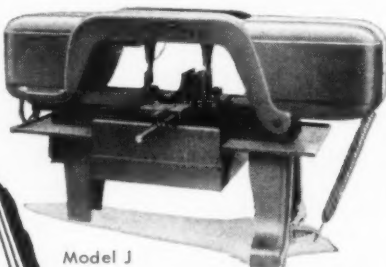
**Greater
CAPACITY!**

That's what you need—greater metal cut-off capacity—to help increase production, a big advantage of the

JOHNSON MODEL J BAND SAW

It cuts 10" rounds, 18" flats. It's sturdy, fast, has extra rigidity that permits higher speed operation and extra accuracy. To decrease your cost of cut-off work, insist on a Johnson Band Saw.

Also a smaller, speedy, lighter Portable MODEL B Saw, with all the accuracy of the larger model. Capacity 5" rounds, 10" flats.



Model J

**Write for
CATALOG!**

JOHNSON MANUFACTURING CORP.
ALBION, MICHIGAN

types. **Pope Machinery Corp.**, 261 River St., Haverhill, Mass.

42. Milling, broaching, cutter sharpening, grinding, lapping and flame hardening equipment is described in publication No. M-1684. New data on the large plain centertype grinding machines and expanded data for the cutter grinding machines is included in this 1950 catalog. **Cincinnati Milling and Grinding Machines, Inc.**, Cincinnati 9, O.

products. Five models are described as to their capacities and specifications. **Hardinge Brothers, Inc.**, Elmira, N. Y.

46. Featured in the collet chuck catalog is a new chuck's external and internal gripping and releasing action. Holding pressures are easily selected by a manual adjusting ring with a positive ball detent lock. **Sutton Tool Co.**, Sturgis, Mich.

47. Bulletin No. 31 concerns the **Trico** visible oil cup and gauge, both combined

43. **Ry-Alloy Ground Flat Stock** is the trade name of an oil hardening tool steel especially designed for making dies, jigs, tools, stamps, fixtures, machine parts, etc. This steel requires only cutting to shape and finishing the cut edges to complete many parts. A leaflet describes **Ry-Alloy Ground Flat Stock** in detail, giving stock sizes and prices. **Joseph T. Ryerson & Son, Inc.**, 7558 W. 16th St., Chicago 80, Illinois.

44. A two page, illustrated bulletin describes the **Mausser vernier caliper** for outside, inside and depth measurements. Several new improvements are featured in the presentation. **The George Scherr Co., Inc.**, 198 Lafayette St., New York, N. Y.

45. Bulletin SMP is a presentation of the **Hardinge high speed precision machines** with special application for manufacturers of screw machine

faster driving!

easier tightening!

DANLY

**KNURLED SOCKET HEAD
CAP SCREWS & STRIPPER BOLTS**

stronger assemblies!

FASTER DRIVING! Knurled heads assure a firm finger grip for easy setting by hand! Danly Knurled Socket Head Cap Screws and Stripper Bolts can be driven almost all the way "home" before the wrench is applied for final tightening.

EASIER TIGHTENING! Hexagon socket heads accommodate convenient key type wrenches, assuring easier driving in awkward locations and permitting more compact assembly. For special jobs, special wrenches are easily made from standard hexagon stock.

STRONGER ASSEMBLIES! Danly Knurled Socket Head Cap Screws have been tested to 289,200 pounds per square inch . . . shearing under the head is minimized! Precision threads assure more actual thread bearing and permit harder tightening without danger of stripping.

SEND FOR THIS FOLDER for complete catalog and purchasing information.

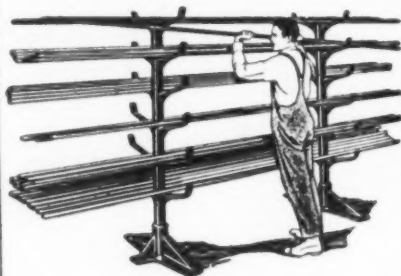


DANLY MACHINE SPECIALTIES, INC.
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The **BROWN TIME-SAVING RACK** saves the time previously lost end-hauling each bar of stock its entire length from the old-style, closed-side Rack, the Brown Rack requiring but a few inches of side movement. Each length, width and thickness of stock is displayed in gold-fish visibility for instant selection. Workmen waiting for stock are served without waste of time, and returned to their production machines to turn out a maximum of output.



Any time you require additional storage space, all you need do is to add more units. If you want to relocate it at any time, you can do so quickly for it is unattached to the building. It is a simple, durable article made of metal in five styles. It can't burn, warp, sag or twist; depreciation is practically nil.

SEND FOR BULLETIN No. 26-B DESCRIBING THE BROWN TIME-SAVING RACK.

BROWN ENGINEERING CO.

126 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

in one unit. Cup can be attached to bearings and oil cases at any convenient distance or position from the machine. **Trico Fuse Co., Milwaukee 12, Wis.**

48. **Automatic air line filters**, regulating valves and air line lubricators are among the products listed in the brochure by **M-B Products**. Full listing of tools is given with specifications and prices. **M-B Products Co., 130-134 E. Larned St., Detroit 26, Mich.**

49. **Manhattan Moldisc** is a bonded wheel for portable grinding tools. It is claimed the disc has free cutting qualities for fabricating stainless steel and other alloys that must be ground without generating excessive heat. **Manhattan Rubber Div., Passaic, N. J.**

50. The "**Direct Reading Power Chart and Drilling Time Indicator**" provides a convenient, pocket size visual calculator for use in estimating and engineering departments. The folder also commemorates the 75th anniversary of the company. **Cincinnati Bickford Tool Co., Cincinnati, Ohio.**

PRECISION HAND-TAPPER

ONLY

\$19.95



**STOP
TAP
BREAKAGE**

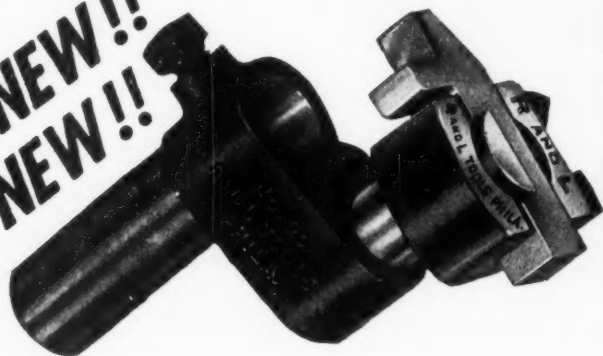
Saves costly hours spent in prying out broken taps . . . speeds up tool room tapping.

MODEL DL mounts on any 2 3/4" drill press Column . . . long 3 1/2" spindle bearing assures right angle tapping. 7 1/2" depth of throat . . . adjustable "tap to table" clearance 0" to 48". Equipped with 7 adapters, 8/32" to 1/2".

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R AND L TURRET BACK REST HOLDER

For use on R and L Turning Tools. Simple design allows for convenient interchanging of the R and L carbide surfaced or Roller Backrest (above) and the R and L Burnishing Backrest shown below. Built in sizes to fit all R and L Turning Tools.



R and L Tools Changed in Ten Seconds for Right or Left Hand Turning.

Manufacturers of Precision Tools for Screw Machines.

Also Turning Tools . . . Roller Backrests . . . Carbide Backrests . . . Tap and Die Holders . . . Universal Tool Posts.

This
**TURNING
TOOL...
Replaces
14 TOOLS**

Can be changed from
RIGHT to LEFT
. . . in 10 Seconds

Write for Literature

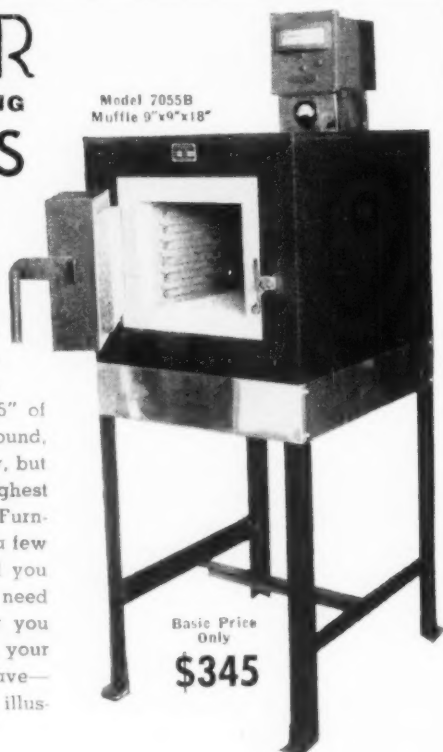
R AND L TOOLS

1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.

LUCIFER

ELECTRIC HEAT TREATING FURNACES

Lucifer introduces a completely new line of Electric Heat Treating Furnaces. The models No. 7055 are floor models — rigidly constructed of the finest materials obtainable and have a temperature range up to 2000°F. Look at the construction — at least 5" of insulating refractory all the way around, and not one or two types of refractory, but four different types are used for highest efficiency. That's why "LUCIFER" Furnaces are so cheap to operate — only a few cents an hour for most of them. And you only have to buy the equipment you need now — later you can add whatever you want without any premium or loss on your part. Think of the money you can save — and the convenience. Send for free illustrated literature.



MODEL	SIZE	BASIC PRICE	WITH ACCES. GROUP A	WITH ACCES. GROUP B	WITH ACCES. GROUP C	K.W.
7055A	6x6x12	\$195	add. \$39.60	add. \$98.60	add. \$172.50	4
7055B	9x9x18	\$345	" "	" "	" "	6.5
7055C	12x12x24	\$464	" "	" "	" "	13
7055D	18x18x36	\$945	" "	" "	" "	26
7051	6x6x6	\$155.25	Bench With Accessory (Group B)	FLOOR MODEL \$166.75	FLOOR MODEL \$339.25	2
7053	8x8x10	\$270.25	Bench With Accessory (Group B)	FLOOR MODEL \$281.75	FLOOR MODEL \$454.25	3.5
7052	12x12x12	\$385.25	Bench With Accessory (Group B)	FLOOR MODEL \$396.75	FLOOR MODEL \$570	6.5

ACCESSORY GROUP A—Pyrometer & Thermocouple

ACCESSORY GROUP B—Pyrometer & Thermocouple and "Lutronic" automatic temperature control.

ACCESSORY GROUP C—100% Electronic temperature control—ammeter and polished aluminum trim.

SPECIAL SIZES AND TYPES MADE TO YOUR SPECIFICATIONS

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Territories open for distributors or dealers.

Literature Mentioned In This Month's Advertisements

51. **Buckeye Air Sander**, adaptable to medium-duty sanding or light-duty cup wheel grinding; used widely in manufacture of truck bodies and tank and trailer units for the petroleum and motor transportation industries. Informative Air Tool Catalog gives variety of suggestions on air tool problems. **Buckeye Tools Corp.**, Div. 14, Dayton, Ohio.

52. **Rouse Hand Miller**, widely used, inexpensive, high speed, ball bearing motor driven machine for handling light cuts in brass, aluminum, steel, plastics and other materials, fast, accurately and at low cost. Literature available. **H. B. Rouse & Company**, 2214 N. Wayne Ave., Chicago 14, Ill.

53. **Barber-Colman Thread Milling Cutters** engineered-for-the-job; these tools used with B-C 14-15 Hobbing Machines give faster output in worm thread milling. Results shown to be a floor-to-floor time 1.6 min., and an average of 300 pieces per cutter sharpening. Production Guide File No. 8809. **Barber-Colman Co.**, 8809 Loomis St., Rockford, Ill.

54. **Hartford Automatic Thread Roller** designed to solve standard and special thread rolling problems on small-size screws from .086" to .190" in diameter, with thread length capacity from 1/2" to 1 1/2", rolling consistently to Class 3 Thread Fit. Bulletin TR-100 describes unit. **The Hartford Special Machinery Co.**, 287 Homestead Ave., Hartford 5, Conn.

55. **Glenzer Adjustable Adapters** for multiple spindles allow for adjustment of tool up or down in any spindle. Comprehensive range of sizes to fit Morse Taper holes 1 to 4; adapter sizes 3/4" to 1 7/8". Complete data in Index File B. **The J. C. Glenzer Co., Inc.**, 1546 E. Nine Mile Road, Detroit 20, Mich.

56. **Rodgers Forcing Presses** for fast, efficient pressing, bending, forming, straightening. Available in portable or stationary models—horizontal, vertical, 75° or 90° inclined—100 to 600 tons, with hand-operated or power-driven pumps. New catalog No. 315 gives complete specifications. **Rodgers Hydraulic, Inc.**, 7453 Walker St., St. Louis Park, Minneapolis 16, Minn.

57. **Hammond Duskolectors** stop dust menace which impairs employee health, reduces employee efficiency and ruins valuable machinery. Units are recommended for tool grinding, polishing operations, etc. Folder contains complete information. **Hammond Machinery Builders**, 1614 Douglas Ave., Kalamazoo, Mich.

58. **Sundstrand Bench Center** improves production by providing precision checking of work between centers easier, faster, and within limits of .0001". Free data is available containing complete specifications; ask for bulletin No. 494. **Sundstrand Machine Tool Co.**, 2535 Eleventh St., Rockford, Ill.

59. **New Friction Clutches** on L & J Presses are now available as optional equipment on all presses. They offer high speeds, are adjustable to prevent overloading, do not overheat, provide less starting shock, positive disengagement, greater operator safety. Literature available. **L & J Press Corp.**, 1625 Sterling Ave., Elkhart, Ind.

60. **KRW Hydraulic Presses** in capacities of 25, 50, 60, and 75 tons, highly flexible in design and operation. Useful in blanking, forming, bending, broaching, straightening, stamping, embossing, numbering, upsetting, laminating, pressing and hot or cold forging. See coupon in advertisement. **K. R. Wilson**, 215 Main St., Buffalo 3, N. Y.

61. **South Bend Lathes** stress accuracy, versatility and ease of operation. See coupon in this month's advertisement on various S-B equipment. **South Bend Lathe Works**, 384 E. Madison St., South Bend 22, Ind.

62. **Aber "Curved Tooth" Milling Cutters** consistently out-perform conventional type cutters at a ratio of 2 1/2 to 1. Designed for production men looking for new tool designs to reduce metal cutting costs. Cutters operate at speeds 10% to 25% faster than standard straight-tooth types. Literature from **Aber Engineering Works, Inc.**, Waterford, Wis.

63. **Danly Knurled Socket Head Cap Screws and Stripper Bolts** feature faster driving, easier tightening and stronger assemblies. Folder available giving complete catalog and purchasing information. **Danly Machine Specialties, Inc.**, 2100 S. 52nd Ave., Chicago 50, Ill.

How Production-Wise Manufacturers SAVE SANDING COSTS



FINISHING METAL

This manufacturer of automatic dishwashers, dissatisfied with other abrasives, switched to AP's No. 80 Jewelox Cloth X73. Now reports: "This cloth is the best we've ever used!"



FINISHING PLASTICS

This manufacturer called in AP Engineers on problem of finishing plastic switch plates. Cool-running AP Silver Streak Belts were recommended. Result: Silver Streaks did 25% more work than other belts — eliminated spoilage — cost not a penny more.

Have you got a finishing problem? Ask your distributor about AP Jewel Coated Abrasives or write us today!



Abrasive Products, Inc.

SOUTH BRAINTREE 21, MASSACHUSETTS • MAKERS OF JEWEL COATED ABRASIVES

NEW BOOKS

PRINCIPLES OF MAGNAFLUX

By F. B. Doane, President of Magnaflux Corp., and C. E. Betz, Vice President of Magnaflux Corp. Published by Photopress, Inc., Chicago, Illinois. 1941, Third Edition. 388 pages.

This is probably the most useful and comprehensive report written on the subject of magnaflux inspection methods. The authors have obviously attempted to orientate the reader with every conceivable aspect of the process.

178

METAL FINISHING

By L. H. Langdon and Staff. Published by Finishing Publications, Inc., 11 West 42nd St., New York 18, N. Y. 468 pages. \$2.00

This is the 18th Annual Edition of the guidebook-directory for the metal finishing industry, and is devoted exclusively to metallic coatings. In the directory section is a listing of dependable suppliers and manufacturers of plating and finishing supplies, grouped by both name and product. Under the guidebook section are authoritative articles on engineering, abrasives, cleaning, electropolishing, plating and surface treatments.

MACHINE and TOOL BLUE BOOK

March, 1950

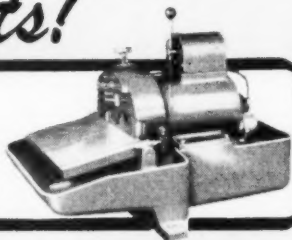
Of the fourteen chapters, three supply a background to the reader by way of historical and present day developments and requirements, the principles of magnetism and fundamental concepts of the magnaflux principle. The remaining chapters explain the contents of the book in an orderly and understandable sequence. The headings are: Magnetizing Methods; Field Distribution; Magnetizing Current Characteristics; The Inspection Medium; Detectable Defects; Magnaflux Indications of Surface and Sub-surface Defects; Inspections of Welds and Large Castings and Forgings; Non-Relevant Indications; Demagnetizing.

All new terms are defined and problems and examples are given throughout the text. And, to further acquaint the reader with the various processes and detection of defects, 170 illustrations and diagrams are included in the book.

THIS CARBIDE GRINDING TEAM *Cuts Costs!*

WICKMAN-NEVEN BENCH GRINDER

—designed especially for grinding or lapping carbide. Has special reversible 1 HP motor, 12 gal./hr. coolant pump, easily adjustable table, swiveling wheel guard.



STEEL-BONDED DIAMOND WHEELS

—practically indestructible with extra long life. Diamond particles stay in place until completely worn. Finish tools better for longer tool life.

RESINOID-BONDED DIAMOND WHEELS

—for faster and freer carbide cutting and less frequent wheel dressing.

STEEL-BONDED CHIP-BREAKER DIAMOND WHEELS

—with many times the service life of other chip-breaker diamond wheels. Reduce wheel and tool costs materially and speed grinding 3-4 times.

GET THE FACTS

Complete information on these Wickman products is yours for the asking. Write today.

THE Wickman
MANUFACTURING CO.

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WOODROW WILSON AVE.
DETROIT 3, MICHIGAN

YOUR CREATIVE POWER

By Alex F. Osborn, of the Batten, Barton, Durstine and Osborn advertising firm. Published by Charles Scribner's Sons, New York, 1948. First Edition. 375 pages. \$3.00.

Alex Osborn has successfully attempted to convey, in words, the rewards of creative thinking. His text, dealing exclusively with imagination, is mainly a product of his own mind, but the examples with which he animates the composition are in reality short narratives of persons who were successively creative.

ENGINEERS' DICTIONARY

By L. A. Robb, member American Society of Civil Engineers. Published by John Wiley & Sons, Inc., New York, 1949. Second Edition. 664 pages. \$12.50.

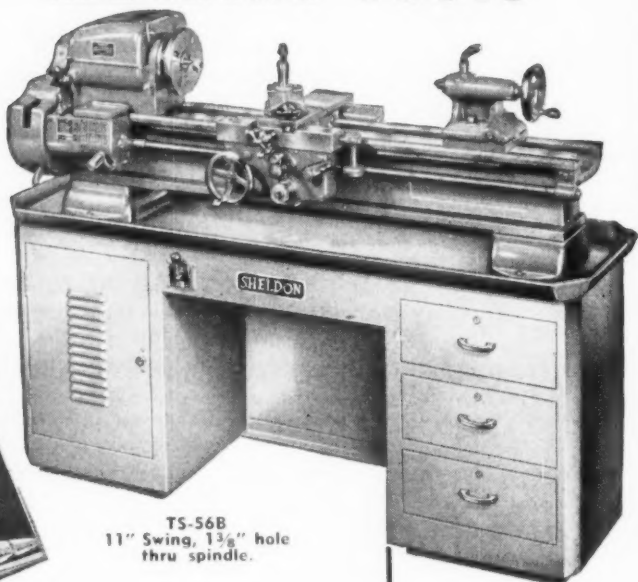
This is an English/Spanish and Spanish/English dictionary of terms common to the civil, mechanical and electrical engineering fields. Many subjects not covered in the first edition, but now thoroughly followed are radio, photogrammetry, soil mechanics and airport construction. Important terms in mining, shipbuilding, logging, sugar milling and oil field operation are also included.

Some of the rewards the author enumerates for creative growth are money, success, personality, happiness and usefulness. As he points out, some of these are not truly rewards, but rather the object of creation. He further goes on to show that creative ability is within reach of all people, young, old, sick, poor or uneducated. Some of the fuels needed for creative imagination he points out are experience, travel, reading and self-education, with emotion as the main drive.

Some of the best ways to attack a creative task are to create the right mood, pick a target to be reached, break down the problem, use imagination as stepping stones, and to find as many alternative methods and means as possible to accomplish the task.

The author, while writing on an elusive and serious subject, at no time becomes mired in heavy, dull passages.

66 variations of 5 modern machine tools

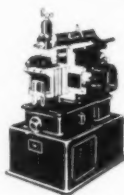


TS-56B
11" Swing, $1\frac{3}{8}$ " hole
thru spindle.

Here is a Catalog every buyer of Machine Tools should have for it shows, describes and gives specifications of today's most advanced line of moderate priced precision machine tools.

Write for your SHELDON Catalog Today.

These tools will be demonstrated in Booth No. 430 at the A.S.T.E. Show in Philadelphia, April 10-14.



12" Back
Geared
Shaper

SHELDON MACHINE CO. Inc.

Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
4242 N. KNOX AVENUE • CHICAGO 41, ILLINOIS. U. S. A.

What's New in METALWORKING

NEW SINGLE SPINDLE AUTOMATIC DESIGNED FOR CARBIDES

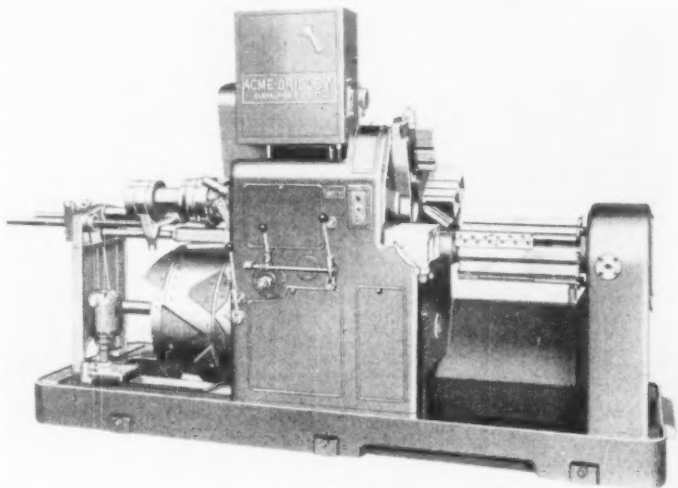
While this new machine is designed specifically to accommodate carbides wherever possible, high speed steel tools can also be accommodated. As may be seen from the illustration at the bottom of the page, the design of the new Acme-Gridley Model M Single Spindle Bar Automatic represents a considerable departure from previous models single spindle machines. In addition to its heavy and sturdy construction to meet the requirements of modern cutting tools, the Model M is engineered to provide flexibility and simplicity of tooling in order to complete a part as much as possible on the automatic.

The frame is of box shape design, built up to take the strains from cross slides, spindle drive and turret. The pan is a rigid, double wall structure supporting the headstock, outer support for the turret, and the stock feed mechanism in the rear. Rigid

support for the turret is provided in the headstock and by the outer support, which is connected to the headstock by a triangular housing on the rear side of the machine. In the large, open tooling zone, two lower cross slides of the Acme-Gridley angular mounting type provide opportunity for heavy forming operations, while a third slide is provided for cut off. The indexing turret has five slides for end working and stock stop. Threading can be performed with self-opening dies

• • •

Acme-Gridley Model M Single Spindle Bar Automatic.



or collapsible taps.

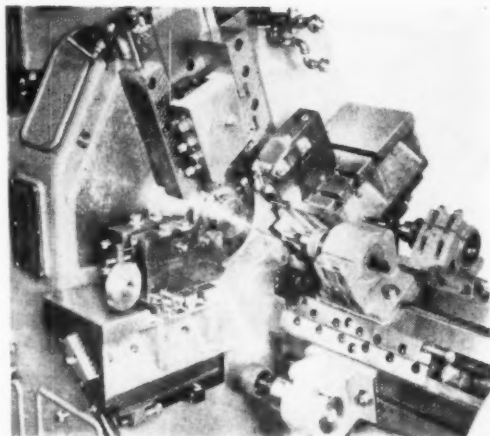
Spindle construction is the same as in Acme-Gridley multiple spindle bar machines—spindle bearings, collets, pushers, guide rings in the pusher tubes, and finger holders are the same for corresponding machine sizes and capacities.

The turret is indexed with an independent motor by a **Geneva movement** located in the outer support. The lock bolt disc and the lock bolt are also located in this housing. This is entirely independent from the toolslide and other machine movements, all of which are controlled by the main drive motor located on top of the machine. With this independently controlled indexing mechanism, it is possible to index the turret one or more toolslides as may be required by the set up.

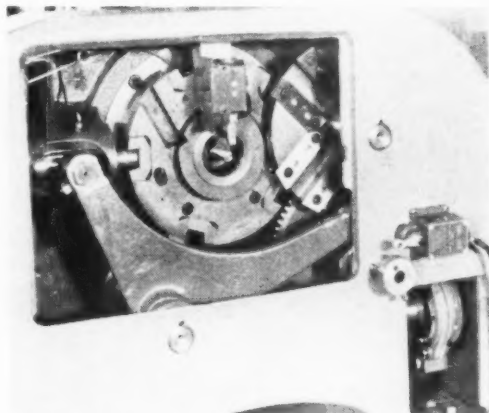
Spindle speed change gears and three automatically controlled range gears provide a wide spindle speed range. Spindle drive is from the pulley shaft through change gears to a jack shaft, thence to a clutch shaft where three clutch-controlled range gears provide as many as three different spindle speeds without changing the spindle change gears. Automatic control of the range gear clutches is from the main camshaft.

Feed control for the main camshaft is by direct drive from the main spindle so that the toolslide feed will always be in proper relation to the work spindle. With a few steel cams of different cam angles and the flexibility of the feed change gears, the standard range of toolslide feed per spindle r.p.m. is from .0040 to .0444. The machine can be arranged to provide a coarse and fine feed range in addition to the standard one, using the same cams and feed change gears. Feed change gears and spindle speed change gears are interchangeable.

Idle time movements, such as chuck opening and closing, stock feeding, return of the toolslides, and other machine movements operated by the main drive motor but not directly connected



View of tooling area showing slides.

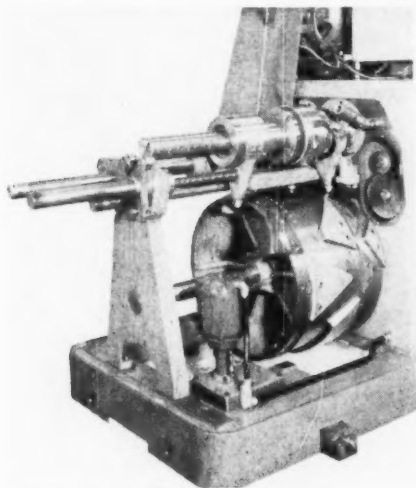


View showing indexing mechanism which is controlled by a Geneva movement. The lock bolt disc and the lock bolt are both visible.

with the feed control, are accomplished by the constant speed shaft driven directly from the pulley shaft and independent of the spindle speed or feed. This fast speed is automatically controlled (as on the multiple spindle machines), or may be engaged by a separate hand lever for use in setting up the machine. The low speed, or feed control is by a hand lever located on the front side of the machine.

The cross slides are independently op-

erated by steel cams located directly underneath the slides, while a third cam set provides independent operation of the cut-off slide. Each of the turret slides is also independently controlled by steel cams located on a cam drum in the



The Model M A-G Single Spindle Bar Automatic, showing the heavy spindle with roller rest stock support and safety type spring stock feed. Cam drums and steel cams are easily accessible and require minimum change for any range of similar work.

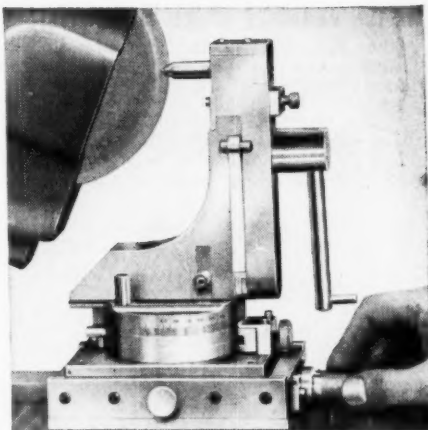
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headstock section. Thus with independent control of each of the three side-working toolslides, and with a few cams of different cam angles for the turret slides, all slide movements can be cammed independently and synchronized with each other, varying the length of travel of the turret slides as required and providing the correct feed per spindle revolution independently on each slide.

The Model M Single Spindle Acme-Gridley Automatic Bar Machine will be furnished in the following sizes:

Machine Size	Spindle Speeds	Horsepower of Motor
2 5/8"	150—1550	25
3 1/2"	120—1220	25
4 3/4"	45—800	25
5 1/2"	28—545	25

Complete information will be supplied by the manufacturer: **National Acme Co.**, Dept. BB, 170 E. 131st St., Cleveland 8, Ohio.



Fluidmotion[®] accurate form-dressing even by a beginner

Two angles and a radius can be dressed in one continuous motion.

- Precise, sharp contours are obtainable consistently to .0001" accuracy.
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- Micrometer feed to wheel.
- Capacity to 14" wheel.
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- 180° radius attachment.

Write us for detailed information on: "Fluidmotion" Radii and Angle Grinding Wheel Dresser, Form Master Angle and Radius Grinding Wheel Dresser, Size Dresser for production grinding, Special Form Grinding of High Speed Steel and Carbide Tools to customer's specifications, Koala Circular Boring Bars, Koala Circular Turning Tools, Vise Jaws (automatic hold-down), Jaw Clamps, Stock-Hog Milling Cutter (removes twice the material in half the time using half the horse-power).

*Reg. U.S. Pat. Off.

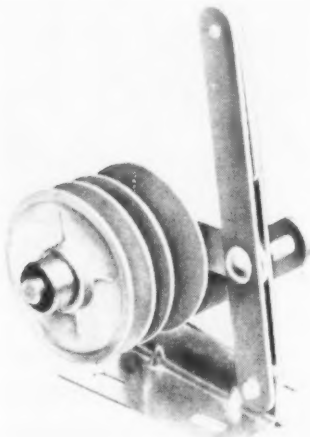
J & S TOOL CO., INC.

471 Main Street, East Orange, N. J.

Representatives in Principal Cities

SMALL VARIABLE SPEED TRANSMISSION

The Die Cast Cub Variable Speed Transmission has recently been introduced by the Standard Transmission Company. This is the newest and smallest of a line which already includes two types and six sizes; it differs from previous models in that the pulleys are die cast and the frame work is constructed



of stamped steel. The die cast spindle rotates on a bronze bushing over a stationary steel shaft. This shaft is anchored to the pivotal frame and is drilled for forced lubrication of the rotating member.

The design has been proved to be rugged and is capable of performing satisfactory work within the limits of its size. A patented belt alignment feature, characteristic of the Standard line, is also included in this model.

The Die Cast Cub Variable Speed Transmission has 3.5" pulleys, gives a 3.3-1 speed range with A section belts. The construction is of precision die cast pulleys, with a stamped steel frame. The base dimensions are 3 $\frac{1}{4}$ " x 4"; the overall dimensions are: 6"; length 5 $\frac{1}{2}$ "; and height 8 $\frac{1}{2}$ ". Weight is 5 lbs. The unit is made by **Standard Transmission Equipment Co.**, 78 W. Union St., Pasadena 1, Calif.

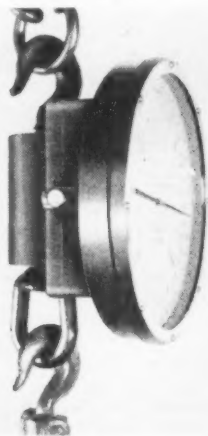
Pullman cars used on some of the trains operating between Chicago and the Pacific Coast make as many as from 72 to 90 round-trips a year, depending on the schedules and layovers.

NEW HYDROSCALE MODELS

Hydroway Scales, Inc., has added several new models to its line of hydraulic crane scales since the introduction of the "Hydroscale" a year ago. The new models round out the line to provide 8", 12", 24", and 30" diameter dials in varying capacities now up to 25 tons. The new large 24" and 30" dials offer more accurate reading, especially in the larger capacities, and adapt the scales to specialized applications.

The "Hydroscale" is simple in construction and functions on the static pressure principle. In its construction, levers, weights and beams have been omitted.

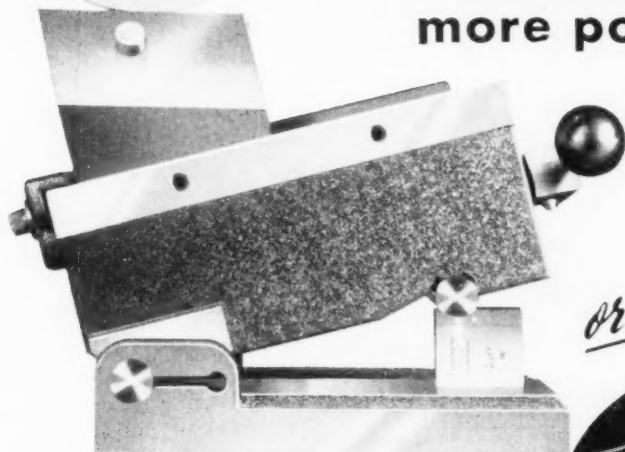
The primary application of the Hydroscale is weighing of stock and materials on the spot without transporting to weighing stations, thus eliminating handling. The compact design of the scale



affords clearance past columns etc., thus conserving on hoist capacity and headroom. A secondary application is protection of equipment against overloading. Hydroscales are manufactured by **Hydroway Scales, Inc.**, 20624 W. 8-Mile Road, Detroit 19, Mich.

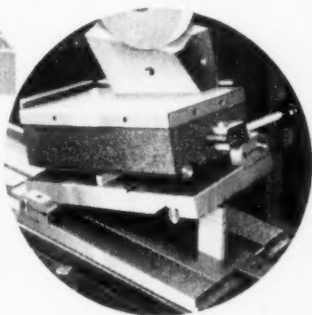
Appointment of **Herbert G. Kieswetter** as assistant general manager of the mechanical goods division, United States Rubber Company, was announced by Ernest G. Brown, vice president and general manager of the division. Kieswetter was formerly vice president and assistant general manager of United States Rubber Export Co., Limited.

what could be
more positive...



or simpler?

The MAGNA-SINE for angular work



The Magna-Sine, used with standard gauge blocks, is the only positive shop method of making fast angular set-ups. Plus this angular accuracy, the work piece is held securely, without distortion, by magnetic attraction on a permanent-magnet chuck.

The Magna-Sine—except magnetic parts—is made of hardened, seasoned steel and all gauging surfaces are ground and lapped flat and square for positive accuracy from every set-up.

Set-ups are made by inserting standard

gauge blocks between the plates of the Magna-Sine. The proper blocks are indicated for all angles in the Table of Constants furnished with every unit. No dials to go out of adjustment; no scales to mis-read . . . no parts to move or go out of adjustment after the set-up is completed.

Write for descriptive bulletin which gives full details and prices on these versatile units. Thousands are in daily use.



OMER E. *Robbins* COMPANY

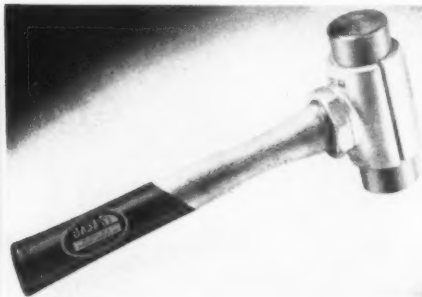
Manufacturers of the MAGNA-SINE and Other Precision Tools

5722 Twelfth Street • Detroit 8, Michigan

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

IMPROVED REPLACEABLE FACE HAMMERS

Greene, Tweed & Co., have redesigned their line of replaceable face hammers. These tools are equipped for rapid replacement and interchange of hammer faces, with faces available in rawhide, Basa molded composition, plastic, copper and babbitt, thus offering a selection of the face that suits the work and prevents mar, chip or "pile up" of the material struck.



The new design features include a freer play between the jaws of the retaining head, thus insuring a positive take-up and firm grip on the faces despite the slightest variations in the circumference of faces. This has been accomplished by enlarging the space between the jaws through retraction of the single locking nut, specially threaded to hold tight under severe shock.

The handle has been shaped to fit the hand, thus perfecting the balance, for further exclusion of worker fatigue. Lacquering of the handle and enamelling of the grip portion preserves tool's cleanliness and appearance. The metal parts of the hammer are finished in a rust-inhibiting aluminum coating which has been baked on to give a hard wearing surface.

For full details on the Basa Replaceable Face Hammer line, write for Bulletin BE-15 to Greene, Tweed & Co., North Wales, Pa.

STERLING STEEL STACKING BOXES

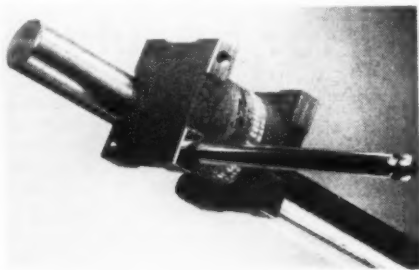
A complete line of steel stacking boxes for stock room and storage use has been introduced by Sterling Factory Equipment Co. These serviceable units are manufactured of 16 or 18-gauge welded steel, in three general types—the regular, with standard squared sides, the bin front, and the smooth end type, the latter being used for easy pouring of small

parts. All these stacking boxes are built 18" long, and are furnished in either 10" or 12" widths, and are available either 6" or 8" high.

Sterling Stacking Boxes have no separate corner pieces. The top rim, which is double the thickness of the usual separate piece, is formed around corners, and welded under end folds, giving the corners unusual strength. All boxes are equipped with either drop or straight handles, as desired. A catalog sheet, giving complete specifications on this useful equipment, is available upon request. **Sterling Factory Equipment Co.,** 189 Charles St., Providence, R. I.

MAGNETIC BASE HAS WIDE INDUSTRIAL APPLICATION

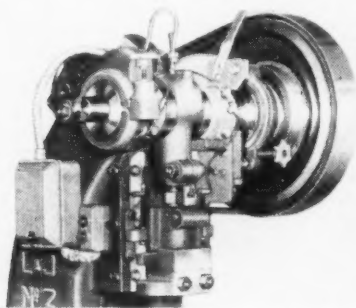
The du Mont Corporation has just introduced the new "Minute Man" Magnetic Base for quick, convenient application of dial indicator gages and other tools. As the picture below shows, a feature of the new Magnetic Base (now green in color instead of black), is its applicability to round as well as flat surfaces. This is effected by relocating the magnet barrel to allow for V slots on one side. Interchangeable brass shafts, 7/32" and 5/16" dia. are provided for ready attachment of any dial indicator gage or height gage.



This device makes it easy to position the gage at the point for easy reading at once. It has a 40 to 50 pound grip on all four sides and its holding power does not diminish with service. In addition for using with dial gages, it holds work in position on surface plates, supplies magnetic power to rods for chip removal from drilled or tapped holes, holds coolant pipe nozzles on machine tools and similar jobs around the shop requiring a magnetic holder. The "Minute Man" Magnetic Base is made by **The du Mont Corporation, Greenfield, Mass.**

NEW FRICTION CLUTCHES FOR L & J PUNCH PRESSES

The L & J Press Corporation announces a new friction clutch that is now available on the firm's inclinable punch presses. The new device is stated to offer four advantages over pin, jaw and sleeve types of clutches which have positive contact faces: 1. Higher operating speeds. 2. It is adjustable to prevent overloading. 3. It has a high rate of engagements per minute without heating. 4. It offers less starting shock.



The clutch's operation is based upon the use of a cone clutch that grips on a self-energizing principle after being first engaged by compression springs, thus the harder the pull, the tighter it grips. The cone clutch is provided with sintered metal facings that are stated to outwear any composition or fabricated material, requiring fewer adjustments and replacements. A safety feature is that disengagement does not depend upon springs. Three steel balls rotating in inclined grooves between the two plates disengage the cone when one of the plates is stopped by a brake. Compressed air, hydraulics or electricity are not required for the operation. However, any of these forces can be used for control purposes instead of conventional foot treadle or hand levers.

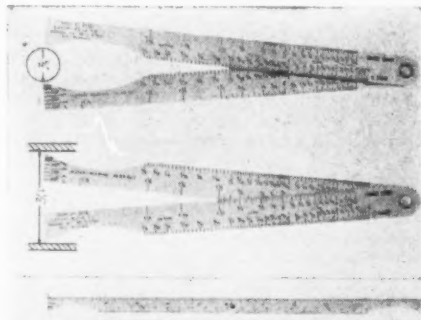
For complete details, write **L & J Press Corp.**, 1625 Sterling Ave., Elkhart, Ind.

CALIP-RULE HAS MANY USES

A combination Inside and Outside instant reading caliper, one side of which opens to a 12" rule, with millimeter readings on the reverse side, has recently been introduced. The distance between the two caliper tips is indicated where the two blades converge at the point where the daylight shuts out. The op-

erator simply switches the blades for the reading desired, either inside or outside.

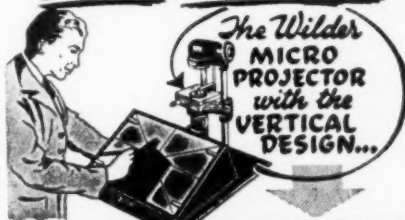
The Calip-Rule is 6¼" long and ½" wide; it is made entirely of stainless steel and can easily be carried in the



vest pocket. This ingenious device is a practical instrument of many uses. It is made by **Calip-Rule Co.**, 565 W. Washington Blvd., Chicago 6, Ill.

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- OPTICAL PROJECTION DETECTS ERRORS
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PRECISION INSTRUMENTS
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TOOL ENGINEERS SHOW
APRIL 10TH PHILADELPHIA—BOOTH 209

NEW FILMATIC PLAIN GRINDING MACHINES

Many features of value in grinding medium to large sized parts are incorporated in the new Cincinnati Filmatic 14" and 16" Plain Grinding Machines, recently announced by Cincinnati Grinders Inc.

Like other C.G.I. machines, the grinding wheel spindle runs on Filmatic bearings; consisting of multiple segments, fixed axially but free to rock radially a slight amount. Immediately upon rotation of the spindle, wedge-shaped oil films are formed between the segments and spindle diameter. They build up to high pressures and automatically adjust themselves to variations in forces created by the grinding action.

The lubrication of Filmatic bearings is automatic, with circulating filtered oil. It precedes spindle rotation, and initiates the starting thereof through a pressure switch. Should the lubricating system fail, the grinding wheel drive motor automatically stops.

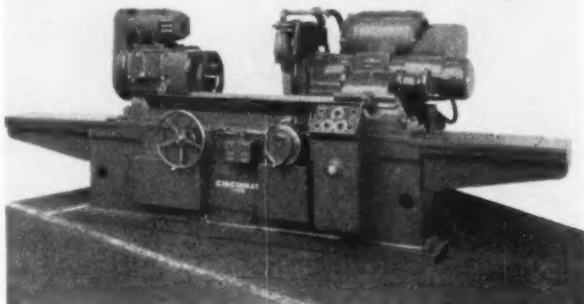
The table is traversed by means of a rack and pinion and a simple drive from the motor. Traverse rates are infinitely variable between 3" and 120" per minute, through a d.c. motor controlled electronically from an a.c. source. This type of drive offers a smoothness and flexibility comparable to hydraulic traverse.

The electrical system for these machines provides automatic acceleration and deceleration of the table at reversal, thereby eliminating shock. In addition, tarry at each end of the table stroke

can be independently adjusted for a time delay of zero to about 18 seconds. Coolant flow and headstock spindle rotation can be stopped and started independently, or in unison with the above table traverse. This is also a function of the electrical system.

Table ways, table drive parts, and the rack and pinion are automatically lubricated. Filtered oil circulates continuously.

The headstock is a dead spindle, d.c. motor driven unit, having a No. 13 B & S



Cincinnati Filmatic 16" x 36" Plain Grinding Machine.

taper hole in the spindle. The unit has an exceptionally long bearing on the table, approximately equal to the entire length of the headstock casting. Spindle speeds are rheostat controlled, infinitely variable from 40 to 144 r.p.m. for the 14" machine, and 20 to 72 r.p.m. for the 16" machine. Matched V-belts and precision silent chain smoothly transmit

SPECIFICATIONS:

MODEL S RA-1, RA-2

5'10", bed "

MODEL S RA-3, RA-4

11'6", bed "

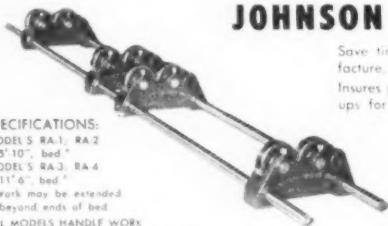
Work may be extended

beyond ends of bed

ALL MODELS HANDLE WORK

MATERIAL FROM 1" TO 24" DIAMETER

LOAD CAPACITY: 1500 lbs. (All Models)



JOHNSON ROTARY WORK ALIGNER

Save time and trouble handling materials requiring rotation in Manufacture, Assembly, Welding or Repair.

Insures perfect alignment of two or more units. Eliminates expensive set ups for miscellaneous jobs. Adapted to centered or uncentered work.

Checks alignment or run-out on any circular materials.

Tubing, shafting, etc. is easily rotated for uniform welding, joining, cutting, or welding fittings or flanges.

A precision tool of finest material and workmanship. Simple. Durable. Write today for complete description.

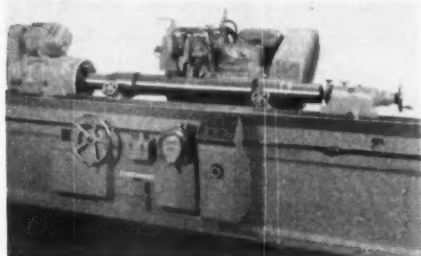
JOHNSON MACHINE WORKS

619 MENOMONIE STREET

EAU CLAIRE, WISCONSIN

TELEPHONE 9314

power from the motor to the face plate. A simple and efficient gravity lubricating system at the front of the headstock, incorporating a reservoir with visible level supply and visible rate of flow, protects the running parts.



Cincinnati Filmatic 16"x120" Plain Grinding Machine, equipped to grind the diameter and adjacent radii on railroad car axles.

Conforming to other sturdy construction details, the footstock bearing on the table is also longer than conventional practice. This has been accomplished by adding an apron extension at each end of the unit. A bellows type dust guard at the projecting end of the footstock spindle effectively excludes dust and grit from this important part.

All operating elements are within convenient and comfortable reach of the operator. Electrical control buttons and rheostats are grouped in a panel, plainly labeled for quick reference, near the operator's right hand.

Thirty extra equipment items are available for these Cincinnati Filmatic grinding machines. One of the most outstanding is automatic wheel balancing; controlled by a lever reached from the operator's normal working position, the grinding wheel can be balanced in a few seconds without removing the wheel mount from the machine. Other details of design and complete engineering specifications may be obtained by writing for catalog No. G-594. **Cincinnati Grinders Inc.**, Marburg Ave., Cincinnati 9, Ohio.

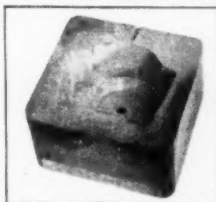
TUNGSTEN ALLOY ADDS TO LINE

Tungsten Alloy Manufacturing Co., Inc., has added rough cored uncased die nibs for collapsible tube dies to its line of standard tungsten carbide items which it supplies to die and tool manufacturers. Tungsten carbide dies for drawing these tubes are getting broad acceptance among the tube manufacturing companies, and

SMASH! HEAT TREATING PROBLEMS SLASH! HEAT TREATING COSTS

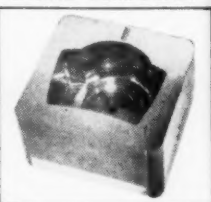
with ... **PHOENIX BRAND** NON SCALING COMPOUND

Originally produced for use in Parker's own plant to prevent scale formation and decarburization during heat treatment of tools and dies, **PHOENIX BRAND NON-SCALING COMPOUND** proved so successful it is now being offered commercially to industry. Not a salt solution but a specially compounded powder for use in hardening and annealing of steels — tested and proven in hundreds of hardening rooms, **PHOENIX BRAND NON-SCALING COMPOUND** pays its way in time and money saved. Obtain increased furnace capacity and production! Recommended for steels hardening up to 1750 F. and for use in all furnaces except bath type. **TRY IT . . .** discover for yourself the amazing results obtained in time and money saved using **PHOENIX BRAND NON-SCALING COMPOUND**.



This can be prevented! Note scale, pitting and decarburization . . . a result of normal heat treating. Time can be saved, furnace production increased, costly polishing after heat treating can be virtually eliminated.

ORDER FROM MILL SUPPLIER OR WRITE TO ADDRESS BELOW



This unretouched photo shows clean, smooth surface after heat treating using **PHOENIX BRAND NON-SCALING COMPOUND**. You too can benefit in time and money saved, eliminate scale, pitting and decarburization.

A Product of:

Parker



THE PARKER STAMP WORKS, Inc.

Established 1871
HARTFORD, CONNECTICUT

in many instances tungsten carbide punches are also being used successfully in collapsible tube manufacture.

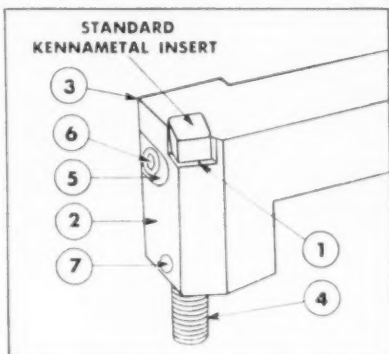
Tungsten Alloy will initially stock eight sizes of these die nibs, ranging from $\frac{3}{8}$ " i.d. to $1\frac{1}{2}$ " i.d., and in the various grades of tungsten carbide best suited to the metal for which the dies are to be used. It is anticipated that, as the use of carbide punches becomes more general, punch nibs in the equivalent sizes also will be added to the standard items stocked.

Use of tungsten carbide dies in making collapsible tubes is a comparatively recent development, however, many leading manufacturers either are using carbide dies, or are studying the possibilities of using them. The use of tungsten carbide punches is less general, but firms which have tried them out have found them to be very satisfactory, and to give long life and economical production. For complete data, write: **Tungsten Alloy Manufacturing Co.**, 65 Colden Ave., Newark, N. J.

Railroads of the United States, having extensive passenger service, now use mechanical washers for cleaning the exteriors of passenger-train cars.

IMPROVED KENNAMATIC TOOL HOLDER

A new and improved Kennamatic Tool Holder has been developed by Kennametal Inc. All of the advantages of increased productivity claimed for this type of tool have been retained, and several



new structural features added which include broached construction, fully enclosing the Kennametal insert to provide greater strength and accuracy; solid backing for the insert in the direction of

PLAY SAFE *with* GUIDE POSTS!

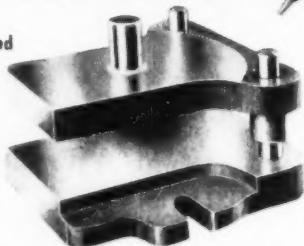


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LUBRICANT**

—The SURE way to prevent ruined equipment and costly delays!

Non-corrosive and highly concentrated to withstand pressures greater than 50,000 lbs. per square inch. CMD lubricant gives your guide posts the best anti-scoring protection available. Safe. Economical. Prevents all metal-to-metal contact. Stays "put"—protects longer, reducing wear on moving parts.



Available as oil or grease. Packed in 4 oz. tubes, 1 and 5 gallon cans, and 55 gallon drums.

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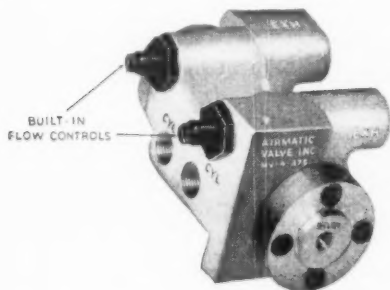
cutting forces. A heat-treated alloy steel shank resists distortion and chip erosion. A hollow back-up screw, provided with a friction lock, permits insert to be pushed out without removing the screw. Improved clamping supplements the cutting forces but does not oppose them. Front wrenching makes the tool useful for multiple set-ups, since the clamp screw is always accessible.

These improvements are available at no additional cost. The manufacturer has issued Supplement 1 of Catalog 49 to cover this line of improved Kennamatics. Kennametal, Inc., Latrobe, Pa.

MASTER AIR AND LOW PRESSURE HYDRAULIC VALVE

A new, compact Master Air and Low Pressure Hydraulic Valve with built-in full capacity flow control meters of the Venturi type, has been introduced by Airmatic Valve, Inc.

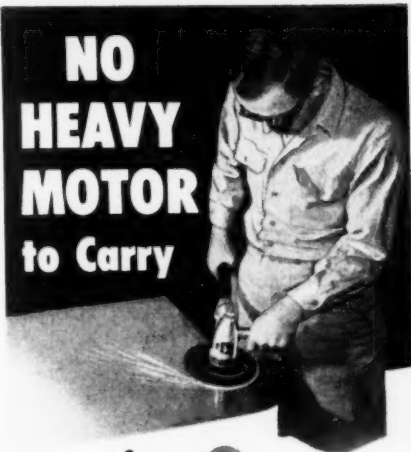
The one-piece balanced spool uses aircraft packing which eliminates metal-to-metal contact between wearing parts. By simply replacing the "O" ring packing renews the valve. This design permits full line volume without any loss of pressure and operation is not affected by line pressure variation.



The Master Valve can be close-coupled to the cylinder, effecting air savings, thereby increasing the speed of operation. In many cases, this method will reduce the overall cost of pipe installation, the manufacturers say.

The Airmatic Model MV-4-375 Valve, illustrated above, can be used in conjunction with pilot valves to provide automatic and semi-automatic operations, sequence of operations, and also remote control paneling. The design is offered in four standard pipe sizes: $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ ". Further information is available from Airmatic Valve, Inc., 1643 E. 40th St., Cleveland, Ohio.

NO HEAVY MOTOR to Carry



with a
Mall
FLEXIBLE SHAFT
GRINDER

Workmen finish larger areas faster, with less fatigue, and can work at any angle, when they use a Mall Flexible Shaft Grinder. Extra-powerful motor with more copper and iron to prevent "burnouts"; rests on tilting, swiveling, pedestal base that rolls right to the work. Dust-free motor greatly increases life of tool, reduces maintenance costs.

Attachments available for Grinding, Sanding, Buffing, Polishing, Wire Brushing — change instantly.

32 Factory Owned Service Stations from Coast to Coast give quick, dependable repair service. Over 1000 Mall Portable Gasoline Engine, Electric, Pneumatic Power Tools for a million jobs. A dealer in any town can supply you.

See your Mall Distributor TODAY and write for FREE BOOKLET "Mall Flexible Shaft Grinders".

MALL TOOL COMPANY

7742 South Chicago Ave. • Chicago 19, Illinois

WHO*

MAKES THE FINEST

CAP SCREWS

SET SCREWS

MILLED STUDS

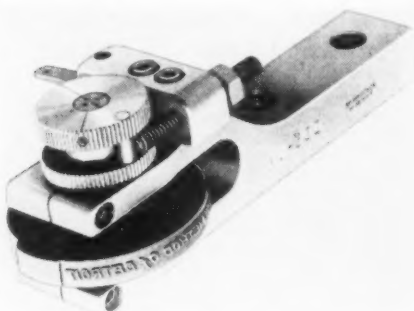
COUPLING BOLTS

Write for name of nearest distributor and our free illustrated folder.

*Wm. H. Ottemiller Company
YORK, PENNA.

AUTOMATIC ROLL MARKER FOR SCREW MACHINE PARTS

An automatic roll marker which permits die marking of screw machine parts during the machine cycle—the tool advancing, marking the part and clearing it, like other tools—is announced by New Method Steel Stamps, Inc. Suitable for both light and heavy work on both automatic and hand operated screw machines, bench and turret lathes, etc., the marker eliminates the need for separate setups for marking, while reducing the handling time, scrap, etc.



The new device eliminates scoring or dragging on parts after marking, since it marks once only; there are no "double impressions." It resets automatically for marking the next part after the marker has cleared one part. It eliminates the need for special drawings of die blanks, etc. for each die. Either solid dies of various diameters or interchangeable type roll holders may be used. Because of ball bearing shaft mounts, a minimum of friction exists. Simple and positive full 360° starting index adjustment of the die in the holder is provided. The unit also permits the interchange of dies in the holder for different parts (changed in a few seconds). Automatically correct spring tension exists, regardless of the starting index setting.

The new automatic roll marker for screw machines is simple in design and easy to set up. Detail drawings of each die usually required to manufacture roll dies are eliminated due to the device's simplicity of design, universal index adjustment and standardization of parts.

Conventional solid roll dies are available for shops handling a limited number of different types of parts. For plants marking numerous types of parts with different markings, "interchangeable type" roll holders with a font of replaceable type dies are available, so that



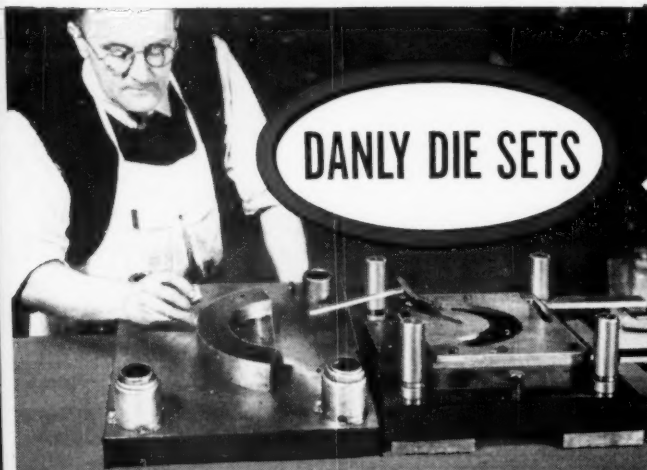
Universal Stock Reel

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
 2. Reel is adjustable to suit height of Press.
 3. Reel can be inclined to any position.
- Stock Reel with plain bearing \$55.00
Stock Reel with roller bearing \$65.00

Manufactured By

John Humm Safety Equipment Co.
253 SHEFFIELD AVE., BROOKLYN 7, N. Y.



DANLY DIE SETS

*less
time*

IN THE DIE SHOP

Reliable Danly precision makes the assembly quicker and easier... possibly reducing the cost by making them square and true to dimension. Precision leader pin and bushing fits secure accurate die closure and protect valuable die components. Danly Die Sets mean better dies in less time.



*longer
life*

ON THE PRODUCTION LINE

Standard, ground and tapered leader pins resist wear... accurate die relationship minimizes punch shearing and die breakage. Precision Danly Die Sets justify the maker's investment in the press setup, preventing premature die wear. Danly Die Sets mean more parts per month.

SEE **DANLY** AT THE
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BOOTH 850

... featuring Danly
Precision Die Sets and
Tool, Die and Gage
Makers' Supplies

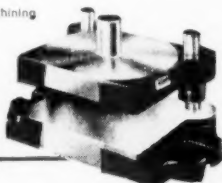
Danly precision makes every Danly Die Set a reliable foundation for the finest die work. And in addition to the performance advantages they assure, Danly Die Sets are quickly available, too, from a nationwide system of completely stocked assembly branches.

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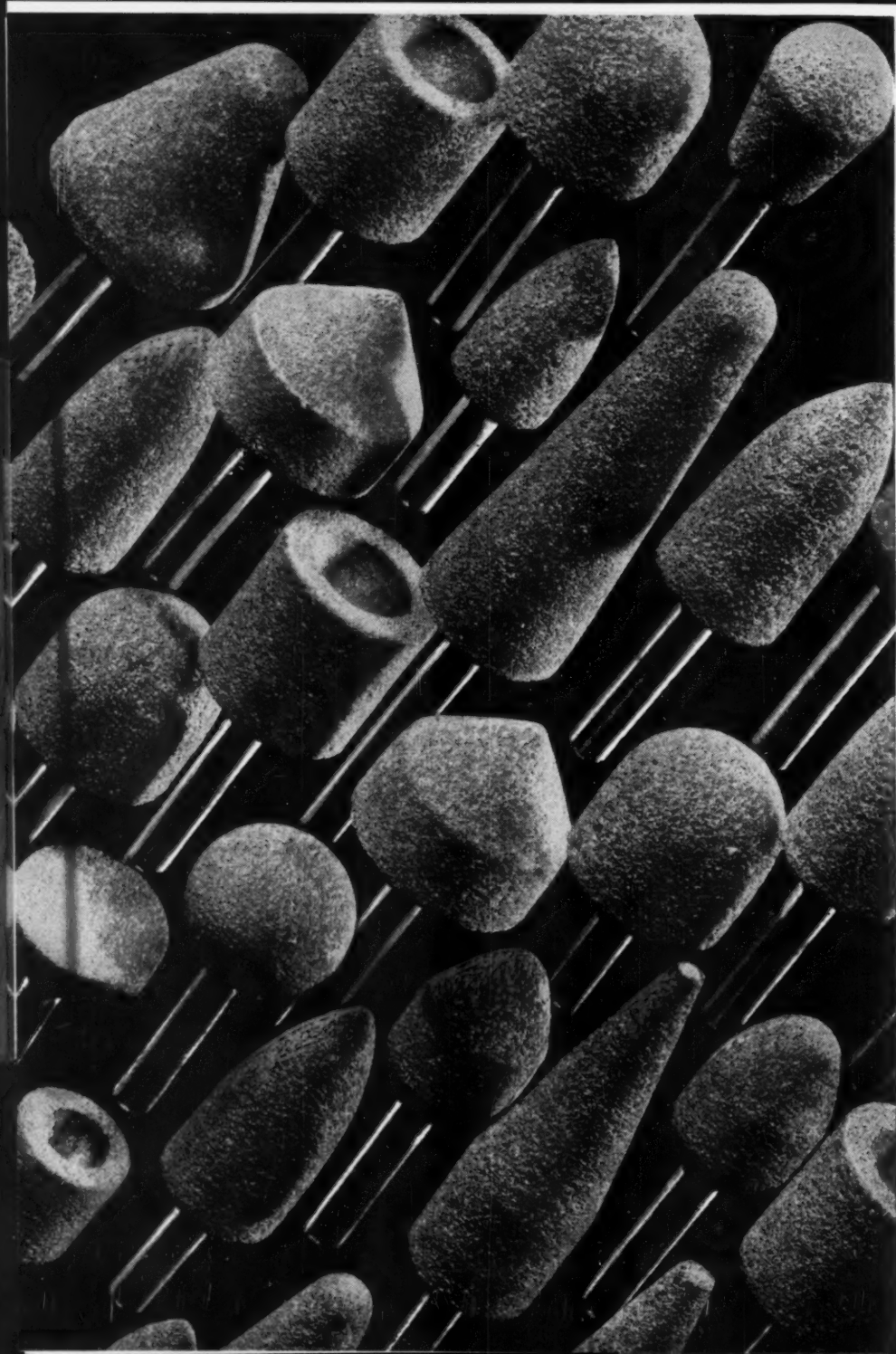
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... and see how Danly's special die set machining service can help reduce your costs.

DANLY



DANLY MACHINE SPECIALTIES, Inc. 2100 South 52nd Avenue, Chicago 90, Illinois
OVER 25 YEARS OF DEPENDABLE SERVICE TO THE STAMPING INDUSTRY



OUT OF 1001 TEST TUBES

The Chicago Mounted Wheels you use today look simple enough—abrasive wheels mounted on steel shanks, but



Those little wheels are the result of more than 50 years of know-how and more than 1001 tests to determine the most exactly perfect combination of grain, grade, bond, shape, shank length and steel analysis to do each job.

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Use Chicago Mounted Wheels—the first wheels ever to be mounted on their own steel shanks—today's finest.

AND, the same expert craftsmanship that has made Chicago Mounted Wheels the most widely used in industry today accounts for the outstanding results you get with Chicago Grinding Wheels and Cut-Off Wheels.



FREE ENGINEERING SERVICE

Let us help you with your grinding problems. Send for our Engineering Data Sheet making it easy for you to submit information from which we can recommend the abrasives that will do your jobs best.

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CHICAGO WHEEL & MFG. CO. 1101 W. Monroe St., Dept. HB, Chicago 7, Ill.

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Name

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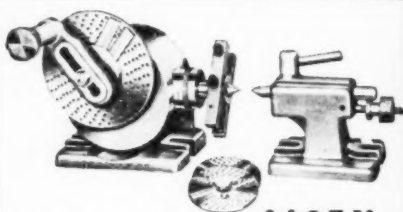
L-W

HIGH QUALITY UNIVERSAL DIVIDING HEADS

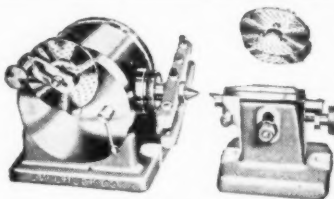
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America's Largest Builders of
Dividing Heads

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Heavy duty headstock and tailstock designed for maximum rigidity. Alloy steel threaded headstock spindle with extra large tapered bearing and take-up adjustment collar. Head tilts to 90° in vertical position. Alloy stress-proof steel worm and bronze worm wheel cut to close limits for accuracy. Ball bearing thrust and adjustable for end play. Complete with three index plates for dividing all numbers to 50 and even numbers to 100, except 96T. Index chart shows all divisions obtainable to 380. Right or left hand models. So sure are we that you'll be more than happy with the way any L-W product does a good job for you, we offer you an unconditional money-back guarantee of satisfaction.



Model SD 6 1/2" Swing for
Smaller Milling Machines.
Threaded to fit L-W 5" Universal Chuck.
Shipping weight, 36 lbs. **\$105⁵⁰**



Model BP 11" Swing for
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Model AU 11" Swing. Fully
Universal for complete in-
dexing and spiral cutting.
Shipping weight, 190 lbs.

\$254⁷⁵

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



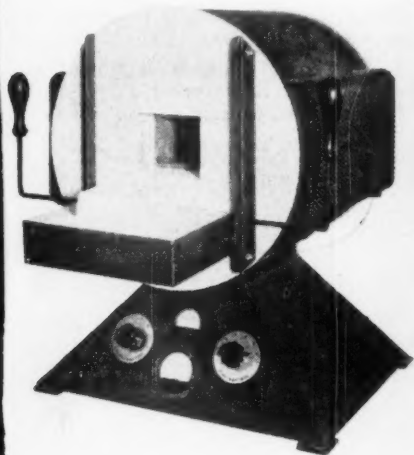
L-W CHUCK COMPANY

2350. ST. CLAIR ST.
TOLEDO 4. OHIO

lettering may be changed without the purchase of additional dies. Type holders are interchangeable with the solid dies in the same holder. Complete data is available from **New Method Steel Stamps, Inc.**, 149 Jos. Campau Ave., Detroit 7, Mich.

ELECTRIC MUFFLE FURNACE HAS RANGE UP TO 2600° F.

This new electric muffle furnace has been developed to meet with the growing demand for higher temperatures for research required in the modern laboratory. It is designed for an operating range of 1700° F. to 2600° F., using "Globar" heating elements, and is equipped with a ceramic muffle. Manual control is provided by a tap-changing transformer mounted in the furnace base. "On-off" control is thereby avoided—adding to the element life.



Standard equipment includes an ammeter as well as an indicating pyrometer with a thermocouple. The inside dimensions are 4¼" wide x 3" high x 7" long, and the electrical rating is 3,500 watts. Furnaces are offered either for 115 volt, 60 cycles or 230 volt, 60 cycles, alternating current only. The furnace features rapid heating from room temperature and low heat loss. Externally prepared atmospheres may be used without affecting element life.

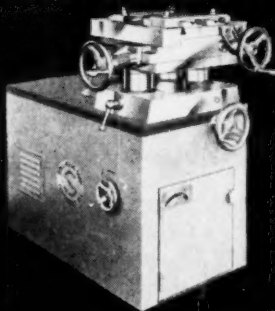
For further information, write **Hevi Duty Electric Co., Laboratory Furnace Division**, Milwaukee 1, Wis.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

CUT

Time and Costs

WITH THE ELECTRIX PRECISION DIE MILLER



The **ELECTRIX PRECISION DIE MILLER** is designed to mill inside and outside shapes and forms such as blanking dies, draw dies and cams. The milling of complicated die and cam outlines is reduced to a matter of minutes with the **ELECTRIX PRECISION DIE MILLER**.

DIMENSIONS:

Height of Machine.....47 inches
Floor Space54x40 inches
Weight - Net1,570 lbs.

For Particulars Write

ROLL FEEDS CORP.

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Builders of "RFC" Roll Feeds

SYNCHRONIZED CONCENTRIC LATHE AND AUTO-DRILL

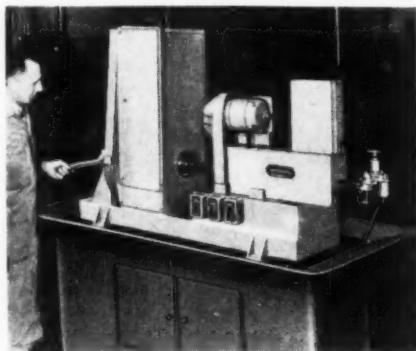
The simultaneous action of drill and lathe of this new machine makes possible the drilling of round piece parts, accurately concentric to .001"-.004".

The Auto-Drill alone is stated to represent a forward step in industrial precision and efficiency, meeting problems which are unsatisfactorily answered by the slow, manually-operated drill press or the costly single-purpose machine. This new machine, however, does more than simplify the operations of several machines in one, since it fills a hitherto-unfilled need. Lack of an automatic, precise means of concentric drilling has resulted in excessive waste of materials and production time.

The machine consists of a stand with a built-in coolant tank and pump, a machine bed, a variable speed lathe head (lathe speeds from 200 to 3000 r.p.m.), and an Auto-Drill Unit with peck and drill attachment, incorporating rotary and reciprocal motions and adjustable as to speed, depth, pressure, and dwell.

The Auto-Drill speed range for the "A" Unit is 850—5000 r.p.m., with a stroke length of 4", and pressure up to 500 pounds with 100 pounds of air. For the "B" Unit, there is a speed range of

375—3000 r.p.m., pressure up to 1000 pounds with 100 pounds of air. Peck motion can be metered down to 1/8" peck per motion, and dwell regulated from 1/2 second, up.



These machines are all semi-special and made with two lathe head sizes.

Literature and information is obtainable. Auto Tool & Engineering Co., 2903 W. Armitage Ave., Chicago 47, Ill.

Dependable MEASURING & CHECKING EQUIPMENT

and Now

HAND WHEELS, KNOBS, HANDLES

Cadmium Plated

Non-rusting — good looking



STRAIGHT and OFFSET TYPE



CAST IRON

READY TO DELIVER
SOLID ROTARY
MACHINE HANDLES



MALLEABLE IRON

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In 10 sizes, ranging from
4 x 3 3/4 x 5 and up.

BOX PARALLELS
In 15 sizes, ranging from
3 x 4 x 12 and up.

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In 19 sizes, ranging from
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SURFACE PLATES
Over 50 sizes, ranging from
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Especially good for hard alloy iron and extremely hard bronze castings. If you are using Anderson Hand Scrapers it is not necessary to buy complete new scrapers in order to use carboloy tipped blades. Simply remove high-speed blade and slip in the Anderson Carboloy Tipped Blade. Available in three widths.



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TIMES LONGER



Send for Bulletin 3-5

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Hand and Power Hydraulic Presses, Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters.

**YOU, TOO,
CAN -**

**SPEED PRODUCTION AND
CUT ASSEMBLY COSTS ...**

See Us, Booth 939, A. S. T. E. Show,
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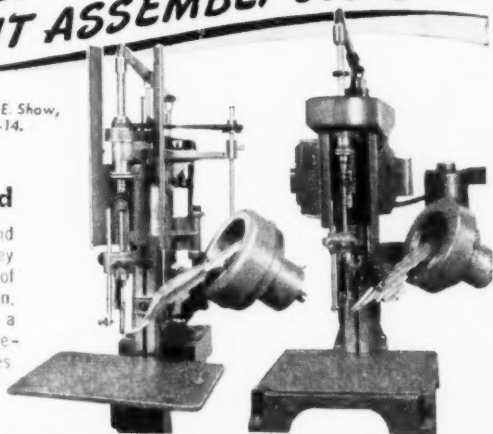
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MODERN Machine Method

DETROIT POWER SCREWDRIVERS offer time and labor saving advantages too great to overlook. They drive all types of screws with no stripping of threads; all screws driven to uniform tension. Hopper fed, no handling of screws. There's a DETROIT POWER SCREWDRIVER to fit your requirements. Three models, bench and pedestal types.

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SEND SAMPLE ASSEMBLY
FOR PRODUCTION ESTIMATE



Model B—Pedestal Type

Model A—Bench Type

DETROIT POWER SCREWDRIVER CO.

2809 W. FORT ST.
DETROIT 16, MICH.

REID SURFACE GRINDERS

10,000 IN USE

THEY HAD TO BE GOOD
TO BE SO FAVORABLY
KNOWN FOR SO LONG

Established 50 Years

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BEVERLY, MASS.

Fewer REJECTS!



If you are striving to reduce the number of rejects on tapping and reaming jobs, just get a Ziegler Floating Tool Holder! Because it always floats freely, it compensates for inaccuracies in set-up, even of as much as 1/32" radius or 1/16" dia. Get a Ziegler and see how it will put an end to your misalignment difficulties.

W. M. ZIEGLER TOOL CO.
13568 Auburn, Detroit 23, Mich.

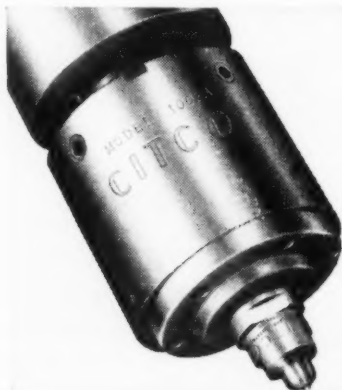
Ziegler
ROLLER
DRIVE

WRITE FOR
CATALOG

FLOATING HOLDER
for Taps and Reamers...

CITCO HYDRAULIC DIAMOND TURNER

To overcome the various operations which are destructive to diamonds, Cleveland Industrial Tool Corporation recently introduced the Citco Hydraulic Diamond Turner, model 1001-A, (Jan. 1950 Machine & Tool Blue Book, p. 205), which turned the diamond automatically every three degrees. This proved to be an important step toward the top efficiency for a diamond turner. However, Citco engineers were not satisfied. Seeing the need for still greater efficiency, a more versatile turner has resulted in the development of the new model 1002-A, illustrated below.



The new Citco Hydraulic Diamond Turner replaces the original and is now adjustable to three ranges of degrees. It turns and holds the diamond rigidly by hydraulic means; it generates on the diamond, a definite and consistent sharp edge in any one of the three ranges, automatically repositioning the diamond every 3½, 7, or 10½ degrees, respectively. Turning impulses are so timed as to split automatically the segment on the diamond face at the completion of the turning cycle, thereby maintaining a new cutting edge throughout the life of the diamond, thus eliminating exposure of flat surface to the grinding wheel.

The new device is precision built and made to last the life of the machine of which it becomes a permanent part. Moving parts are sealed in oil; there is no exposure to outside elements.

The new Citco Diamond Turner is said to remove all fear of burnt and shattered diamonds; it maintains a standard production between dresses, insures maximum efficiency of both wheel and dia-

Air-O-Check

THE VALVE WITH
THE INTERNAL
FULCRUM LEVER

FOR AIR AND FLUIDS



AIRGUNS

For blowing chips from work--
For cleaning out hollow sets,
machine recesses and tee
slots — For drying parts be-
fore inspection and for many
similar uses, Air-O-chek is
the Airgun.

The internal fulcrumed lever is a basic design in all Air-O-chek
Airguns, Sprayguns and Casing Valves.

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SPRAYGUNS

For doing innumerable types
of spray work where the li-
quid is under pressure Air-O-
chek fills a need. Valve has
quick stop-start action. Nozzle
generates fine cone spray.
Streamlined.

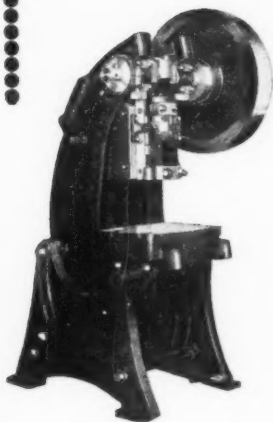
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1054 N. KILBOURN AVE., • CHICAGO 51, ILL.

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LONG LIFE

**FOR DEPENDABILITY
PERFORMANCE**



They are engineered and built to give you
the most for your money. They incorporate
many outstanding advantages and features
of design; include more die space —
chrome molybdenum cranks, wrist pin con-
nections.

Write today for literature.

MARSHALLTOWN MFG. CO.

900 E. Nevada Street

MARSHALLTOWN,

IOWA

• **PORTABLE
ELEVATING TABLE**



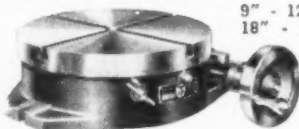
**Saves
TIME
and
LABOR**

Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15 1/4", leaving operator's hands free. Table swivels and locks in any position.

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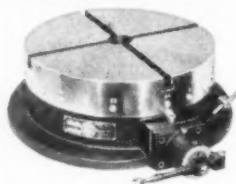
MIDWEST TOOL & ENG. CO.
112 WEBSTER ST., DAYTON, OHIO

**TROYKE ROTARY TABLES
WORM WHEEL OPERATED
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9" - 12" - 15" -
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**BALL BEARING STATION
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12" - 15" - 18"

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write for
Catalog 14

TROYKE MFG. CO. 
CINCINNATI 9, OHIO, U.S.A.

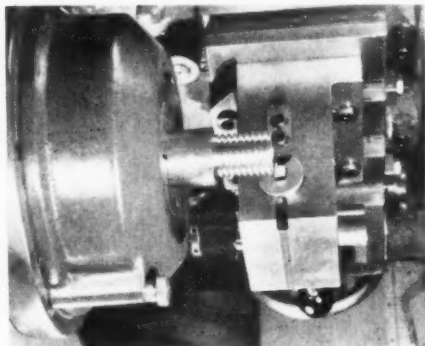
mond, converts the down time used in turning and resetting diamond tools into production time, saves wheel cost, diamond cost, dressing time. The ultimate result is increased production at less cost, by turning out more pieces per dress and the elimination of manual diamond turning. **Cleveland Industrial Tool Corp.**, 1080 E. 222nd St., Cleveland 17, Ohio.

**W & S ATTACHMENTS SIMPLIFY
THREAD CUTTING**

A retractable threading tool holder for use on the cross-slide of Warner & Swasey turret lathes automatically withdraws the tool from the work at any desired point, permitting cuts at full speed close up to shoulders, without the necessity for close attention by the operator.

The retractable tool attachment incorporates a spring release mechanism which is cocked by a handle to move the tool forward, and released by a positive adjustment screw stop attached to the headstock. The stop actuates a cam rod in the attachment to snap the tool back from the work. Positive, clean disengagement of the tool from the work is assured, while the spindle is rotating.

The device can be furnished for use at the front of the cross slide, or in a style for use—with extra linkage—at the rear.



The retractable tool holder is used in conjunction with the Warner & Swasey apron-mounted chasing screw attachment, which permits any standard pitch from 4 to 32 to be cut from the square turret.

Applicable to all saddle-type and Numbers 3, 4 and 5 Warner & Swasey Universal Turret Lathes, the thread chasing attachment can be supplied with a knock-off mechanism for semi-automatic operation if desired. **The Warner & Swasey Co.**, 5701 Carnegie Ave., Cleveland 3, Ohio.

IT'S THE AUTOMATIC CONTROL THAT MAKES IT DIFFERENT!

HUPPERT MODEL 22 DELUXE FURNACE

- Built-in Huppert Automatic Temperature Control—Maintains any temperature from 325° to 1800° F.
- For both laboratory work and heat treating of small parts.
- Multi-Insulated Walls—Cut heat loss, lower operating cost.
- Current consumption 1600 watts.

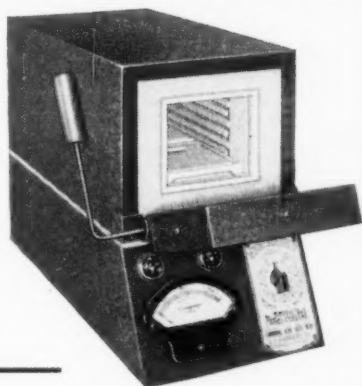
Huppert's Model 22 DeLuxe Furnace has Kanthal elements, totally enclosed contacts, counter-weighted door and two removable porcelain trays. 110 V. A.C. I.D. 4 $\frac{1}{4}$ " x 3 $\frac{5}{8}$ " x 9"; O.D. 12" x 14" x 19". Wt. 44 lbs.

Complete with Huppert Automatic Control & Pyrometer.

\$100

Same Model but all Stainless Steel Construction.

\$120



K. H. HUPPERT

6845 Cottage Grove Ave. - Chicago 37, Illinois

Standard Model 22, manually controlled, also available.

Write for complete literature.

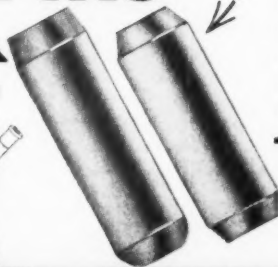
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ACME

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PRECISION

**DOWEL
PINS**

WRITE
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SAFEGUARD

EXPENSIVE DIES AND
MACHINE PARTS

Acme Dowel Pins break before bending or mushrooming—thus saving expensive equipment from ruin through misalignment. Order standard sizes from stock. Attractive prices on special sizes and large quantities.

Acme Industrial Company

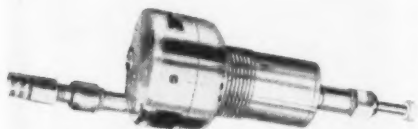
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THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS

AIR TURBINE MOTOR WITH AUTOMATIC GOVERNOR

A new air turbine motor has been introduced by the Onsrud Machine Works, Inc., possessing the unique feature of automatic governor control. First application for this new motor is in the Onsrud D1-G Air Turbine Grinder.



In operation, as the grinder is held against the work, and a resistance is built up that begins to reduce the amount of r.p.m., the Automatic Governor cuts in a greater air volume so as to maintain the rotational speed of the grinder. This improvement in Air Turbine Motor design increases the speed of work as well as prolonging the grinding wheel life.

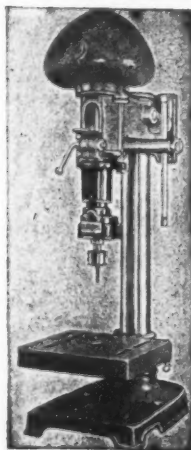
The Automatic Governor is actuated by centrifugal force, developed by the rotation of the grinder spindle. The motor is designed to operate at 50,000 r.p.m., and as long as this rotational speed is maintained, the governor is not actuated. As the r.p.m. decreases due to work load, the governor cuts in. When the work load is removed, the effect of greater air supply under governor control will be to speed up rotation beyond 50,000 r.p.m. When this happens, the governor is again actuated, and reduces the air supply to normal, thus, relatively constant speed within close limits is maintained for spindle rotation.

Air turbine motor design with Automatic Governor can be applied to all Onsrud Air Turbine Motor design. Those interested in the present application (the D1-G Grinder) are invited to write for Bulletin 1000.

Manufacturers interested in Onsrud Air Turbine motors for application to their own equipment or machines are invited to write for complete information. Write Onsrud Machine Works, Inc., 3908 Palmer St., Chicago 47, Ill.

TAP NO. 2-56 TO 3/8" IN STEEL

With only 1 DORMAN TAPPER



* Automatic Reverse and Torque Control

- ... one minute to adjust
- ... prevents tap breakage
- ... no controlled pressure required
- ... operator need not be skilled

* Four Sizes of Dorman Tappers — Tap Capacity No. 2-56 to 2" in Steel

Note wide tap range in each size.

- ... No. 1 Friction Drive Tapper—capacity No. 2-56 to 3/8" in Steel and 1/2" in Aluminum.
- ... No. 2B Positive Tapper—capacity 3/8" to 7/8" in Steel.
- ... No. 3A Positive Tapper—capacity 1/2" to 1 1/4" in Steel, 1/2" to 3/4" pipe taps.
- ... No. 4A Tapper—capacity 3/4" to 2" in Steel including pipe taps.

* Efficient Production Threaders with

- ... Round Split ... Button ... Acorn Dies

* Immediate Delivery

* Low Priced ... from \$44.00

* Write today for descriptive literature.



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Division of Thomson Industries, Inc.

1030 N. PLUM ST., LANCASTER, PA.

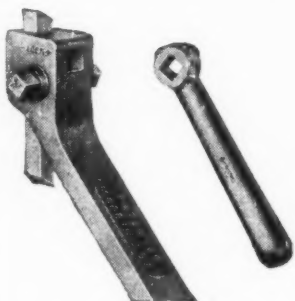
Other Products

Universal Adjustable Drillheads

Standard—1/2" Minimum—Centers to 10 1/2" Diameter Circle
Special Fixed Center & Gear Driven Adjustable Drillheads

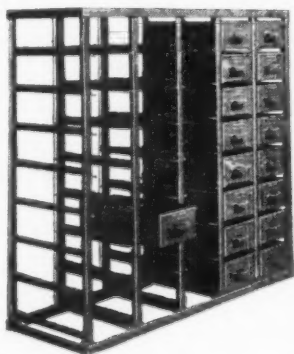
ADAPTABILITY

Stop Searching for the Proper Tool Holder



Get the
**UNIVERSAL
TOOL HOLDER**
ONE TOOL HOLDER
FOR ALL POSITIONS

ACME TOOL COMPANY
71 WEST BROADWAY NEW YORK 7, N.Y.



A KNOCKDOWN RACK in five foot units for convenience in setting up or moving when setup.

RACKING YOUR Boxes Saves Space

STERLING RACKS ARE MADE TO FIT YOUR BOXES, OR WITH BOXES TO FIT YOUR PRODUCT.

A STOCK ROOM FROM BIN FRONT STACKINGS SHOP BOXES.

SAVE TIME
No Emptying
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to stock bins.



STERLING
FACTORY EQUIPMENT CO.

187 CHARLES ST.
PROVIDENCE, R. I.

HIGH PRESSURE OIL-HYDRAULIC PUMPING UNITS

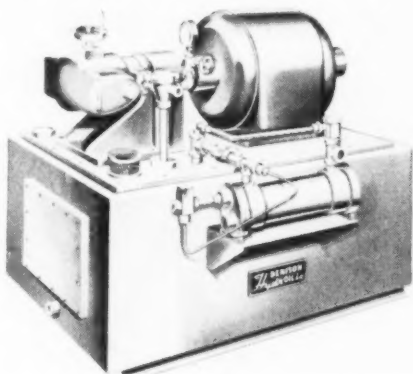
To meet a wide range of fluid power requirements for machine tools and other industrial equipment, The Denison Engineering Company has announced a new series of oil-hydraulic pumping units for regulative pressures up to 5000 p.s.i. These high pressure units are available in 22 models designed to specifications recommended by the Joint Industry Conference, Hydraulic Standards for Industrial Equipment.

Each unit consists of a reservoir base, with all operating components, including pump, relief valve, gauges, and electric motor drive, mounted on the removable top cover. The compactness throughout is said to be an advantage in obtaining sufficient power for many types of modern machinery, without the penalty of excessive bulk.

The reservoir is supplied in capacities of 55, 110, and 165 gallons. It is of welded steel construction and has an access door at the end to simplify tank cleaning. The bottom of the reservoir is above floor level, and it slopes slightly to facilitate draining.

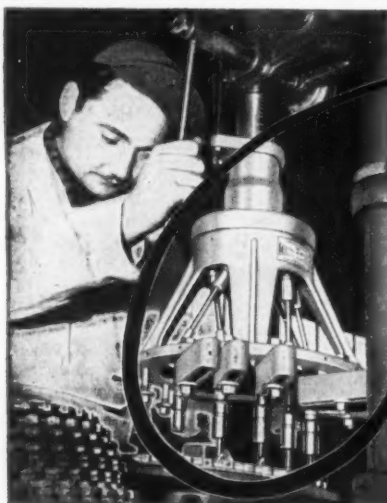
A choice of three series of Denison hydraulic pumps is offered. These are of

axial piston type and may be for either constant or variable volume. The 600 series pumps deliver up to 9 g.p.m. at 1800 r.p.m. in a pressure range up to 5000



p.s.i. Pumps of the 700 series are rated at 20 g.p.m. at 1200 r.p.m. for requirements up to 5000 p.s.i. The 800 series provides

MULTIPLE DRILLING with a . . .



MULTI-DRILL

**Increases Capacity
Up to 800%**

**ADJUSTABLE TO ANY HOLE PATTERN
FITS ANY DRILL PRESS**

If your production requires drilling from 2 to 8 holes in a work piece, a MULTI-DRILL will cut costs and speed output up to 800%. The MULTI-DRILL is universally adjustable to any hole pattern — is compactly built to permit easy, unhampered operation with drill fligs or other special fixtures. Ruggedly built to take the wear and tear of high production work, the MULTI-DRILL will handle your long and short run multiple drilling jobs with ease and economy. The MULTI-DRILL will drill on hole centers as close as $\frac{1}{8}$ " — handle drill sizes up to $\frac{3}{8}$ " in steel. Special adaptations available.

There is a Commander MULTI-DRILL Distributor in your area. Write for his name, literature and complete details.

See us at Booth No. 426 ASTE Show, Philadelphia.

COMMANDER MFG. CO.

4227 West Kinzie St.

Chicago 24, Illinois

Product of Commander — Builder of the Commander Tapper

a maximum 35 g.p.m. at 1200 r.p.m. for service up to 5000 p.s.i. The variable volume pumps are available with a choice of handwheel, pressure compensating, stem or cylinder control of oil delivery. The constant displacement pumps are basically of the same design and construction, exclusive of the controls.

The pump and electric motor are mounted horizontally on the reservoir cover plate and connected by a flexible coupling. Motors supplied with this equipment range from 5 to 75 h.p. ratings, according to service requirements.

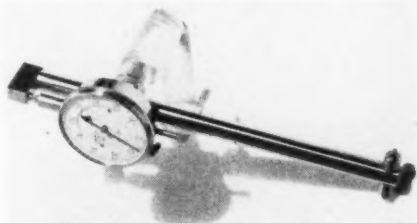
Accurate adjustment of pressure within desired ranges up to 5000 p.s.i. can be made with the relief valve, which is the Denison threaded body type.

Optical equipment is available to extend the versatility of these high pressure oil-hydraulic pumping units. For example, a heat exchanger attachment can be provided for cooling oil in the hydraulic system, and a vacuum gauge added to permit easily checking condition of the oil filter within the reservoir at any time.

Complete data will be supplied upon request to **Denison Engineering Co.**, 1184 Dublin Road, Columbus 16, Ohio.

NEW DIAL BORE GAUGE

Rimat Machine Tool Company, has developed an entirely new dial bore gauge. The new tool gives quickly and accurately, the diameters of internal grooves for "O" rings, snap rings, oil rings, etc., as well as diameters of straight bores.



The instrument locates readily on the diameter of the cut to be measured, and its indicator dial immediately gives the desired dimension. Minimum operator skill is required in its use, and deep holes are measured as readily as shallow ones. Standard instruments are manufactured to measure all diameters from $\frac{1}{2}$ " to 6". Special models are produced to meet unusual customer requirements.

The instrument is produced in two

Fast Speed--Slow Speed any speed-and instantly

No stopping--no belt changing, with

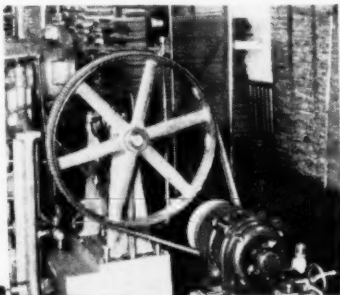
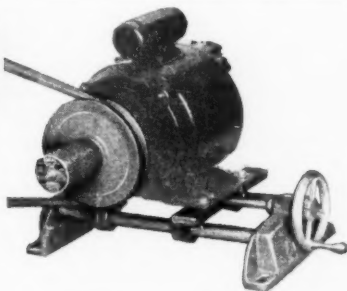
LOVEJOY VARIABLE-SPEED PULLEYS

Easily installed with old or
new equipment

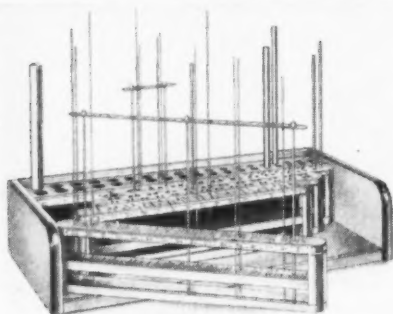
Infinitely variable control as type of work, temperature, speedability, or production schedule require. Duties from fractional to 8 h.p. Ratios to 3:1. Compact. Accurate. Durable. Low cost. Deliveries from stock. Write for illustrated catalog showing scores of uses. Also wide V-belts, sheaves, and adjustable motor bases.

LOVEJOY FLEXIBLE COUPLING CO.

5026 W. Lake St. Chicago 44, Ill.
Mfrs. Lovejoy Flexible Couplings and Lovejoy Univ. Joints.



ACRO DRILL ROD RACK...



SAVES TIME AND MONEY — HELPS YOU:

- Maintain inventory in each size.
- Select proper size at a glance.
- Place drill rod in accessible convenient locations throughout plant.
- Conserve space — it's compact.

HOLDS 20 LETTER 47 FRACTIONAL AND 60 NUMBER SIZES

Each Acro Drill Rod Rack holds 26 letter, 47 fractional and 60 number sizes each indicated with its corresponding decimal size.

Take a look at your present method of storing drill rod and write for bulletin offered below.

Free Bulletin

This four-page folder gives complete details of this modern, handy drill rod rack. Send for your copy today — ask for bulletin BB-30.



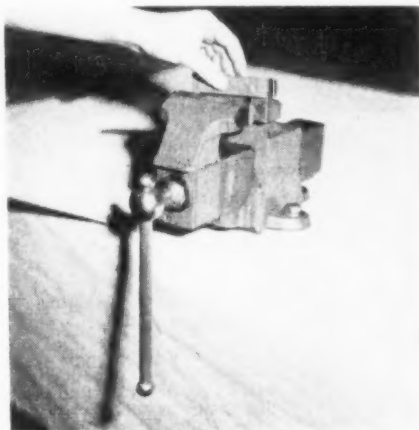
ACRO METAL STAMPING CO.
338 E. RESERVOIR AVE., MILWAUKEE 12, WIS.

series—the series S giving direct readings in thousandths over the entire range of the instrument, and the T series giving plus or minus indications in ten-thousandths for any dimension to which the gauge is set. Corresponding models in both series have the same relatively wide range.

The use of this tool is warranted in many applications. Standard tip sizes are 1/16" o.d. and 1/8" o.d. on specific models. However, where these are too large, special tips are available for measuring snap ring grooves as small as .030" in width. Literature giving complete information is available from **Rimat Machine Tool Co.**, 1117 Air Way, Glendale 1, Calif.

WISE JAWS PROTECT DELICATE FINISHES

The "Clipper" Vise Jaw, recently introduced by Johnson Machine Works, is a false jaw designed to fit all standard vises, from 3" to 6" in width. The jaw is constructed of a specially designed, high carbon spring steel back, with a composition fibre face which is stated not to crack, splinter or break under ordinary fore. "A product of many uses" is the phrase which the manufacturer employs to describe this useful device. It will not mar delicate finished or plated surfaces.



The "Clipper" Vise jaw is a useful aid to machinists, electricians, and other craftsmen who handle delicate or finished products which require careful appearance and workmanship. Complete information on this useful device is available upon request from **Johnson Machine Works**, 617-619 Menomonie St., Eau Claire, Wisconsin.

Tap #0 to 3/4" with . . .

1 Commander TAPPER

The Commander Tapper's exclusive torque control thinks for its operator—automatically stops when taps are dull, overloaded or strike bottom in blind hole tapping.

You get maximum tap protection because the torque control can be set to protect all taps in the range from No. 0 to 3/4".

Spring clutch drive eliminates slippage and wear—provides smooth, quiet, easy operation.

Commander Tappers are furnished to fit any drill press.

See us at Booth No. 426 ASTE Show, Philadelphia.

COMMANDER MFG. CO.
4227 W. Kinzie St., Chicago 24, Ill.



Write for illustrated circular
and name of
nearest
DISTRIBUTOR

Any operator
does precision
tapping with
a *Commander*
TAPPER

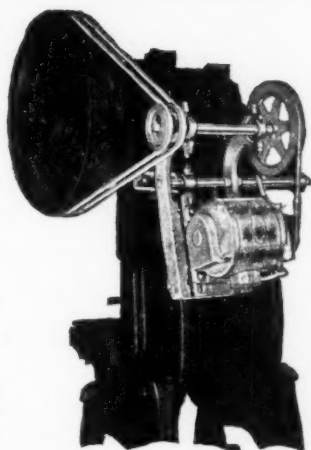
Product of *Commander* . . . Builder of the *Multi-Drill*

Modern MOTOR DRIVES

FOR EVERY TYPE OF
MACHINE TOOL & PUNCH

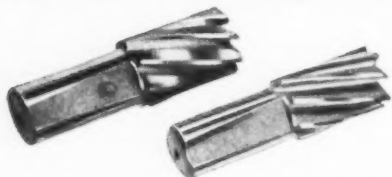
. . . PRESS . . .

Zip up production by gaining the advantages of independent Drives. The MODERN Drive using quiet, trouble-free V-Belts saves on power and eliminates the hazards and maintenance of line shafting. MODERN Drives are inexpensive — easy to install — will outlast the equipment they are mounted on. (Send today for full information on how you can cut costs and increase production. No obligation — but write today.)



MODERN MOTOR DRIVES DIVISION OF **NICHOLS ENGINEERING CO.**
3818 W. GRAND AVE. CHICAGO 51, ILLINOIS

YOU PROFIT on every
job you send to Rutland!



Rutland reworked or repaired
cutting tools are guaranteed to
give new tool performance —
at a fraction of the new tool cost.

Recutting • repairing • replacing Carbide tips.
Special tools from obsolete or standard tools, etc.

Call or Write

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ARTUS PLASTIC SHIM



AND
**FEELER
GAUGE
STOCK**

The **COLOR**
tells the
THICKNESS

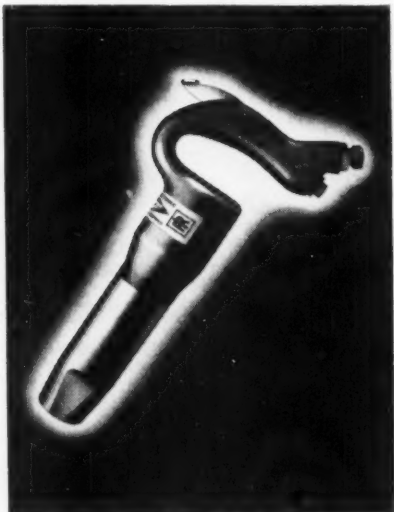
Each thickness a distinctive, easy to
identify color. Impervious to oil. Long
lasting. 5"x20" sheets. Special sizes to
order. Handy assortment, shim stock, 12
colors—12 thicknesses (.001-.030). Bound
together. \$4.25.

Order today. Immediate delivery.

INDUSTRIAL PRODUCTS SUPPLIERS
434 Broadway, Dept. H, New York 13, N. Y.

CONTROLLED POWER CHIPPING HAMMERS

A line of chipping hammers based on
a new design to meet the exacting cutting
conditions imposed by present-day met-
als is announced by Ingersoll-Rand
Company. Known as the Controlled
Power Chipping Hammer line, it has a
high performance range and offers a
selection of 15 power sizes (with 5 basic
hammer sizes) to meet a wide variety
of requirements. Each basic hammer size
is available in normal-cut, extra-cut, or
supercut type, which is made possible by
a design variation in one part inter-
changeable throughout the whole line.



Through the new hard-surfacing Ira-
met process used exclusively by Inger-
soll-Rand, piston life has been increased
12.3 times, according to I-R. Other im-
portant parts of these tools which may
be subjected to wear are also plated
with Iramet to give the tools extra long
life. The new Airite valve proportions
the amount of air fed to the front and
rear of the piston in order to maintain
top cutting efficiency under all condi-
tions; it provides a smooth flow of power,
and eliminates short stroking and loss of
power on heavy cuts.

Controlled Power Chipping Hammers
are designed for better weight distribu-
tion, and comfortable handles enable op-
erators to do their work with greater
speed and less effort. Three types of
handles are available which all lock in
place in a positive manner. Front-end

design allows more chisel "play-off" which makes the Chipping Hammer easy to use and keeps operator fatigue at a minimum.

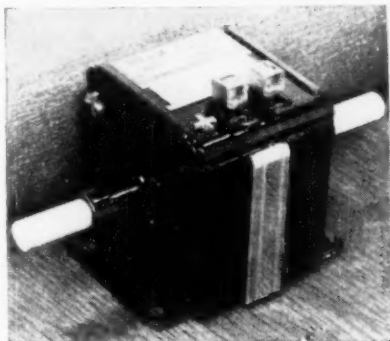
These tools were developed by Ingersoll-Rand in answer to industry's need of chipping hammers that are equal to the demands made by present-day steel castings, new alloys, high-tensile-strength cast iron, etc., and at the same time improve the quality of the products by reducing operator fatigue. **Ingersoll-Rand Co.**, 11 Broadway, New York 4, N. Y.

INDOOR CURRENT TRANSFORMERS

Indoor, Type MR through-type current transformers for low-voltage metering indoors with or without thermal demand meters are now available from Westinghouse Electric Corporation. The new transformers have an exceptional accuracy, with ASA class 0.3 at burden B-0.1, and a continuous current rating of 200% while not exceeding a temperature rise of 55°C. Accuracy is maintained over this entire current span so that only two current transformers—200- and 400-ampere ratings—are required to meter in the complete range from 10 to 800 amperes. Use of grain-oriented Hipersil in

the core reduces weight and dimensions to a minimum.

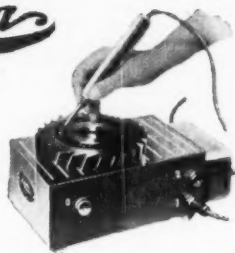
The type MR current transformer is mounted in a compact metal case with Moldarta cover and a removable, silver-plated primary conductor. Secondary



terminals are mounted on phosphor bronze supports and have solderless connectors that will accommodate No. 6 to No. 14 conductor. No short-circuiting device is used since the open-circuit voltage under full load is only approximately

MARK and DEMAGNETIZE IN ONE OPERATION

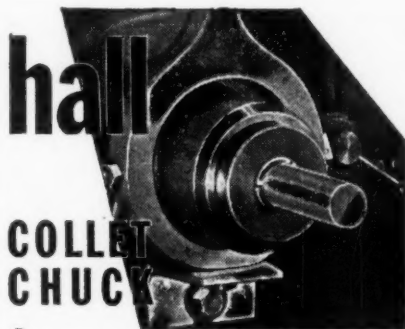
THE
Luma
WAY



The Luma combination etchtool and demagnetizer etches, demagnetizes, anneals and solders. Permanently marks hardest steel with ease of a pencil.

Write for complete information.

Luma Electric Equipment Co.
P. O. BOX 132-H TOLEDO, 1, OHIO



SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295;
1-inch capacity, \$95

Round, square or hex collets, plain-serrated
HALL MANUFACTURING COMPANY
622 Tularosa Drive • Los Angeles 26, Calif.

100 volts. Transformers are designed for easy mounting in any position in a meter box or on a switchboard.

Type MR transformers are for operation up to 600 volts with primary current ratings of 200 or 400 amperes to 5 amperes. A three-wire transformer is also available with a ratio of 200-200 to 5 amperes.

For further information write **Westinghouse Electric Corporation**, Dept. BB, P. O. Box 2099, Pittsburgh 30, Pa.

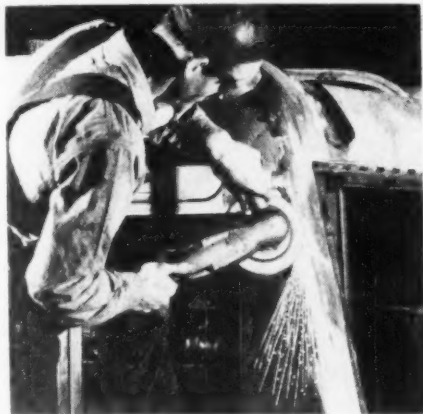
MEDIUM-DUTY, AIR-POWERED SANDER

A new portable air-powered sander, stated to be adaptable to both medium-duty sanding or light-duty cup wheel grinding, is announced by Buckeye Tools Corporation.

The design of this newest addition to the Buckeye Stream-Power line of portable air tools has been streamlined to reduce tool weight and size, improve tool balance and increase working efficiency. Although smaller and 10% lighter than previous models of equal capacity, the new unit has 25% more power, as proved in numerous field tests.

The sander will be available in five models, with speeds of 7500, 6000, 4500, 3600 or 2400 r.p.m., and is designed for use with 5-inch or 7-inch sanding pads,

depending upon model selected. For cup wheel grinding, wheel sizes of 4", 5" or 6" are indicated by the specifications.

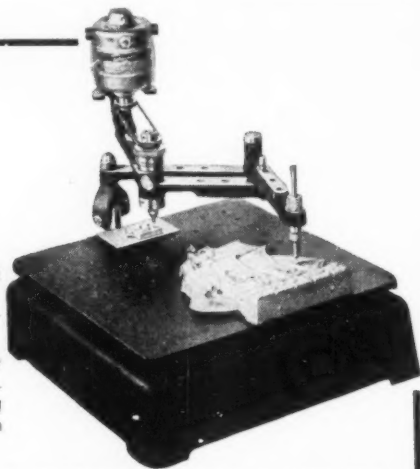


Complete information on the new Buckeye medium-sander may be obtained by writing to the Sales Department, **Buckeye Tools Corporation**, 21 W. Apple St., Dayton 1, Ohio.

MICO

2 and 3-Dimensional ENGRAVER

• NOW you can do three-dimensional milling by tracing shape of enlarged master with stylus. The 252 Engraver fills the need for a portable, inexpensive, dependable and accurate machine to make small dies and molds for plastics, rubber, glass, or die castings, and other forming operations. Master can be reproduced in any of four reduction ratios.



Improved partograph design simplifies conventional engraving of templates, nameplates, panels, trademarks and machined parts.

Write for 8-page illustrated folder which gives complete details.

MICO INSTRUMENT CO. 78 TROWBRIDGE ST.
CAMBRIDGE, MASS.

441 STANDARD SIZES OF MARSHALL STEEL PRECISION GROUND FLAT STOCK

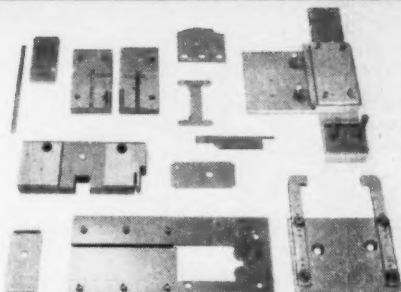
The world's largest range of sizes of precision ground tool steel in three grades are available, ready for immediate shipment and the layout bench.

WATERcrat: A fine grained electric furnace high carbon tool steel. It has been wet ground to remove all bad surfaces and to assure velvet finish of virgin metal.

OILcrat: An outstanding product of careful handling assures you of a fine grained electric furnace oil hardening ground flat stock ready for the layout bench.

AIRcrat: This air-hardening tool steel shows less size change and offers a greater safety in hardening than either of the other grades. Box 108-C

Write for descriptive literature, catalog of sizes and prices.



MARSHALL STEEL CO.
LA GRANGE, ILLINOIS

The Aristocrats of Ground Tool Steel

NEW TOOL BITS SAVE GRINDING TIME

A modern lathe tool bit with a new shape, said to be the only tool bit supplied in this shape, is announced by the Dow Mechanical Corporation. These new tool bits, designated as "Du-Bits" are made of a modern high speed steel, and due to their unique shape, are said to speed up sharpening and grinding time. It is stated that by their use, these tools will allow a speed increase of up to 75% or more, with increased tool life between grinds. The risk of crack damage due to excessive grinding is thereby minimized.



The "Du-Bits" are made with the lead clearance and the point clearance already formed in the blank, as can be seen from the illustration. Left-hand

lead clearance is also present in the tool bit, merely by using it with the opposite side up. The manufacturer states that in some cases it has been found that only stoning of the cutting tip is necessary. In most cases, only two minor grinds are necessary, and the tool is ready for use.

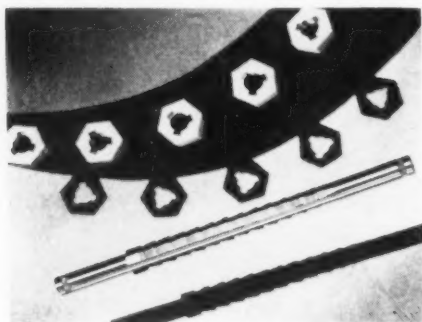
"Du-Bits" are supplied in several standard high speed steel grades, ground, and in a variety of standard cross-sectional sizes and lengths. They are made to fit standard tool holders. For complete information, write **The Dow Mechanical Corp.**, Dept. BB, Thompsonville, Conn.

Ferracute Machine Company, Bridge-ton, N. J. announces the appointments of **G. W. Brunton & Son**, 2882 Delaware Ave., Kenmore, N. Y., as their representatives in the Buffalo-Rochester area; and the **H. A. Smith Machinery Co.**, 609 Syracuse-Kemper Bldg., Syracuse 2, N. Y. as representatives in the Syracuse area.

Appointment of **Clarence H. Endress** as chief engineer of Willard Storage Battery Company, Cleveland was announced recently by C. E. Murray, executive vice president.

GLENNY BROACH CUTS THREE KEYWAYS IN SINGLE PASS

The Kase Machine Company has introduced a new Series "LK" Glenny push broach that cuts three keyways in a workpiece with a single pass. This new



3-keyway broach is similar to the standard Glenny broaches in that the blades are interchangeable, as well as adjustable for depth of cut.

Glenny 3-keyway broaches can be used to cut one or two, as well as three keyways in a single pass, to meet individual

job requirements. Because of the three blades extending from the broach body, however, Glenny bushing-type adapters can not be utilized with the new Series "LK" broach to cut keyways in bores larger than broach diameter.

These broaches can be furnished in standard sizes ranging from 5/16" to 1 1/2" in increments of 1/32". Blade widths range from 1/16" to 3/8", depending upon the broach diameter. These new tools have been designed for production operations on hydraulic, air, and hand-operated presses.

Glenny 3-keyway push broaches incorporate the same design and construction as standard units in the Glenny line; they feature fully-protected cutting blades, chatter elimination, absolute centering in minimum time, and simple over-all operation. When used on production jobs, individual blades can be removed for resharpener and substitute blades can be inserted to maintain a constant production level. Complete information is available upon request to **The Kase Machine Co.**, 18428 Buffalo Ave., Cleveland 19, Ohio.

Here's how others are getting **BETTER PRODUCTION OF PRECISION BORES** *They control their machines better*

The better an operator can analyze the precision bores he is producing, the better his machine will produce. He must know the exact size, any front or back taper, out-of-round, bell mouth, etc. When he knows it **IMMEDIATELY** after the work leaves the machine, any needed adjustment can be immediate, to prevent a second bad piece, or correct a drift outside tolerance limits or Quality Control range. Comtorplug makes this possible, giving laboratory accuracy in a gage of shop ruggedness. Shows actual measurements. Gives a fixed, not a passing, reading. Gages holes 1/8" to 8" dia. to a fraction of .0001". Automatic features assure precision in a unique but positive manner. Send for full details.

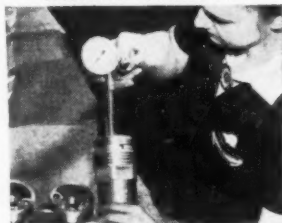
REQUEST BULLETIN 40

COMTOR CO. 62 FARWELL AVENUE • WALTHAM, MASS.

For data on COMTOR GAGE Precision External Gage, Request Bulletin 30



MACHINE OPERATOR



INSPECTOR

**NOTCHING TUBING OR
PIPE ENDS EASILY WITH**

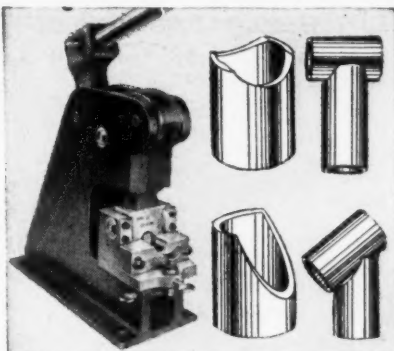
ARC-FIT

Patent No. 2,126,519

**IN POWER PRESS
OR HAND PRESS**

Arc-Fit is a notching unit for preparing pipe or tubing ends in making welded or braced tubular joints. Arc-Fit will prepare the ends of a pipe or tube in less than 5 seconds. Arc-Fit is a production tool that will cut your production costs. It is applicable in any industry where pipe or tubular construction is used.

- Arc-Fit can be utilized in any power press.
- Arc-Fit can be furnished for any size tubing or pipe.
- A hand press can be supplied with Arc-Fit units for shearing pipe or tubing sizes 2 inches or under.



- For sizes over 2", angular cuts other than 90° and slotting operations. Quotation furnished on request.
- Arc-Fit does not deform pipe or tube. No grinding or finishing operation is needed.
- Engineers can now design for tubular construction and cut costs.

Write today for circular and prices.

Manufactured Exclusively by

VOGEL

TOOL & DIE CORPORATION

2525 Moffat Street

Chicago 47, Illinois

. . . . SHARPENS METAL SAWS IN GANGS! SALVAGES MILLING CUTTERS

Resharpens slitting and screw slotting saws in gangs . . . in one setting! And sharpens form milling cutters, too!

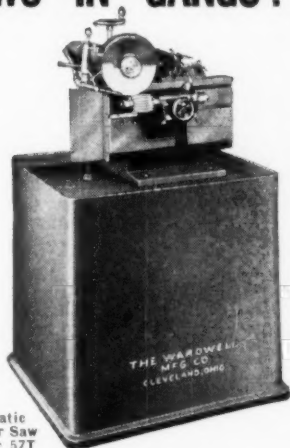
- Automatically indexes a gang of saws, one row of teeth at a time.
- Grinding wheel is shaped to suit the gullet of the tooth.
- A group of 250 saws .015" in thickness can be sharpened at one time.

Capacity: From 2" to 8" in diameter and in gangs up to 3 3/4" thick, with tooth spacing up to 1 1/4".

Can be set up for other special work.

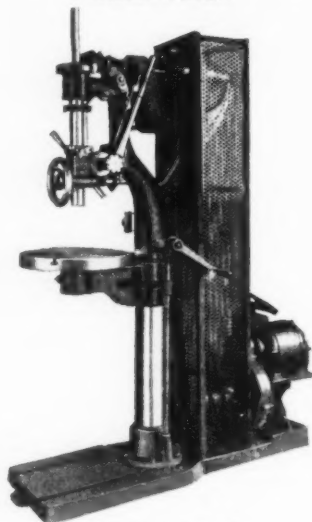
Write for bulletin 57T

Automatic
Circular Saw
Grinder 57T



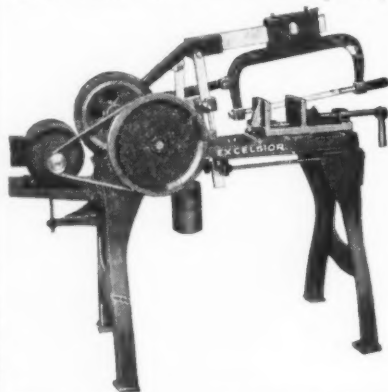
THE WARDWELL MANUFACTURING CO.
3165 Fulton Rd. Cleveland 9, Ohio

**ROYERSFORD-EXCELSIOR 21-INCH
MOTOR-DRIVEN BACK-GEARED
DRILL PRESS**



1½" Drill Capacity
V-Belt or Gear Drive

M2A HACK SAW 6" x 6" Capacity



Write today for free descriptive literature.

**ROYERSFORD FOUNDRY
& MACHINE CO., Inc.**

BOX B

ROYERSFORD, PA.

**REGULATING AND HEATING UNITS FOR
WELDING OPERATIONS**

Electric Arc, Inc., announces its latest combination for pre-heating before welding and stress relieving after welding—the new 40 KVA Model RTA Regulating Unit (illustrated) and 40 KVA Model AC3 low frequency Induction Heating Unit by the Smith-Dolan System.



This combination is designed for use in limited space where the flexibility of a 10 KVA induction heater is not needed. The RTA Regulating Unit is arranged for operation on 220/440 and 550 volts at commercial frequencies. The AC3 Heating Unit is small enough to be placed near the work with easy accessibility.

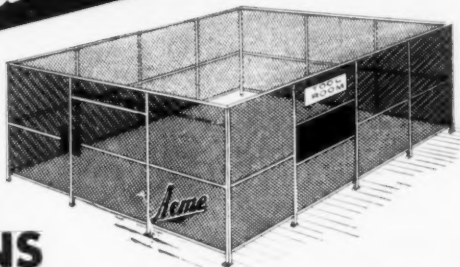
With Models RTA and AC3, more equipment can be added as required, and when larger jobs are contemplated, the Model AC3 Unit can also be used as a booster unit with the other Smith-Dolan heating equipment, manufactured exclusively by Electric Arc.

Dimensions of the RTA Regulating Unit are 20¼" wide, 31" deep, 29¾" high, and approximately 620 lbs. in weight. The AC3 Heating Unit is 35" wide, 32" deep, 46¼" high, and approximately 815 lbs. in weight.

Further information may be obtained by writing for catalog material to **Electric Arc, Inc.**, 152-162 Jelliff Ave., Newark 8, N. J.

Leaders for 50 Years
1899-1949

TOOL CRIBS and PARTITIONS



Standard Sections Woven Wire Mesh Panels and Doors to enclose Tool Cribbs, Stock rooms and other enclosures.

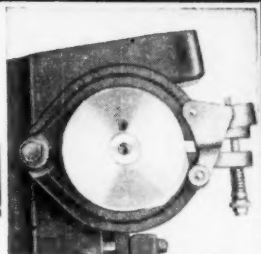
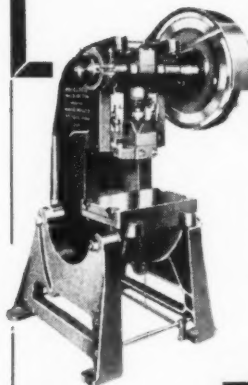
IMMEDIATE DELIVERY

Write for Catalog

Acme Wire & Iron Works
3519 E. Canfield — Detroit 7, Mich.

Automatic Cam Actuated Brake OF

PRESS-RITE
POWER PRESSES



STOP . . . the press automatically at "top center" with a brake that is cam actuated. Braking power is adjusted by the same simple conventional method used in ordinary constant drag brakes and can be instantly set to compensate for various weights of dies used. With cam actuation, constant drag is eliminated and full motor power is utilized to turn out more work at lower cost.

- Other cost cutting features of Press-Rite Presses include:
- Exclusive non-repeat safety mechanism
 - Triple ramway lubrication
 - Heavy duty reinforced frame

See them at your dealer today.

WRITE FOR BULLETIN P-350R.

6 MODELS
5 to 30 ton cap.

Sales Service Machine Tool Co.



PRESS
RITE
PRESSES



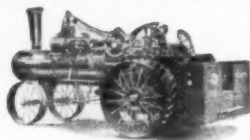
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RITE
SHAPERS



KELLER
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The World's Most Fascinating Hobby

Send 25 cents (refunded with first \$1.00 purchase) for our illustrated catalogue of the **WORLD'S LARGEST SELECTION** of model engine castings and drawings — Models of every type and for every purpose including steam, gasoline, traction and live steam $\frac{1}{4}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ " & 1" scale locomotives.

MINIATURE ENGINE LABORATORIES
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**PROVIDE A FAST
HANDY MEANS OF
INTERCHANGEABLE NUMBERING**



the **ACROMARK**
Company

15 Morrell St. Elizabeth 4, N. J.
"THE ORIGINAL MARKING SPECIALISTS"

POCKET COMPARATOR FOR INSPECTION OPERATIONS



The Pocket Comparator is a precision optical measuring instrument for the inspection of small parts or for small dimensions on large parts. It fulfills the need for a multi-purpose inspection instrument. Heretofore, it has usually been necessary

to use a different device for checking linear measurements, circles, angles, radii, etc. The Pocket Comparator performs all of these inspection functions. The instrument embodies a new principle, permitting the user to compare through a magnifying lens the part to be checked, against a finely calibrated pattern or reticle. The lens is a triple-design aplanatic type of great accuracy and has a magnification of approximately 7 to 1. The instrument was developed and is manufactured by Bell and Howell Company.

The reticle of the Pocket Comparator is calibrated for measuring lengths, widths, complete circles, radii and angles. The upper part of the reticle has lengths graduated in steps of $\frac{1}{64}$ ", $\frac{1}{32}$ ", $\frac{3}{64}$ ", $\frac{3}{32}$ ", $\frac{1}{8}$ ", $\frac{3}{16}$ " and $\frac{1}{4}$ ". There is also a linear rule of $\frac{1}{2}$ " with .005" increments, and a 10 mm. linear rule with .2 mm. increments. Circles are shown graduated from .002" to .050" diameter and from $\frac{1}{64}$ " to $\frac{1}{16}$ " diameter. The lower half of the reticle is patterned to measure angles between 0 and 90° in steps of 5°, and to measure radii from $\frac{1}{16}$ " to $\frac{3}{8}$ ".

The Pocket Comparator separates in the middle to permit cleaning the interior optical surfaces and, for adjustment of focal length to meet the eye requirements of the individual using the instrument. Transparent, plastic material is used between lens and reticle to permit the entrance of light on the reticle and work to be measured.

Although the instrument is new to industry, the manufacturer of the Pocket Comparator has been using it extensively

for five years. Consequently, it has been thoroughly tested for general tool room use including checking forms and sizes of punches and dies, gauges, templates and layouts, as well as for checking the forms and dimensions of all types of cutting tools. It has been found useful in checking the amount of wear on the cutting edges of all types of cutting tools, punches, etc., and for checking the form on circular and flat form tools and the size of small holes, fine threads and wires.

Inquiries about the Pocket Comparator should be directed to **National Tool Co.**, 11200 Madison Ave., Cleveland 2, Ohio.

COMBINATION TOOL HOLDER AND FOLLOW REST

An ingenious device which combines the features of a tool holder and a follow-rest in one tool has recently been introduced by Dasso Tool Products. The tool, called the Followrest Tool Holder, virtually eliminates the necessity of using bulky machine followers or steady rests in turning long, small diameter work on lathes. The use of this tool permits the operator to remove more stock per cut with absolute concentricity, according to the manufacturers, than is possible with

the use of steady rests, and to do it with a minimum of set-up time.

The body of the holder is made of a high grade steel forging measuring $\frac{5}{8}$ " x $1\frac{3}{8}$ " x $6\frac{3}{4}$ "; it accommodates a standard $5/16$ " square tool-bit, an ideal size for turning the small diameter work for which the tool is designed. The holder will take all diameter work from the smallest to 1" and even larger, simply



by adjusting the span of the hardened steel rollers. The head of the holder is completely adjustable up or down, in or out, affording complete flexibility.

The Followrest Tool Holder is described in detail in literature available from **Dasso Tool Products**, Dept. BB, Box 13, Lincoln Park, Mich.

Memo re: STEEL STAMPS & MARKING DEVICES

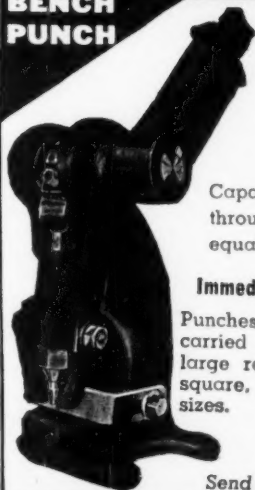
That Newco bevel on New Method's does a swell job of giving clear markings with less effort and longer stamp life.

Better get a copy of their catalog and look it over for ways and means to cut our marking costs.

Write to:

NEW METHOD STEEL STAMPS, Inc.
149 Joseph Campau, Detroit 7, U.S.A.

FRONT LEVER BENCH PUNCH



**STURDY
•
DURABLE
•
HANDY**

Capacity: $\frac{7}{16}$ " hole through $\frac{1}{4}$ " steel or equal.

Immediate shipment.

Punches and dies are carried in stock in a large range of round, square, flat, and oval sizes.

Send for Circular.

T. H. LEWTHWAITE MACHINE CO.
312 East 47th Street New York 17, N. Y.

famco Model "612" METAL CUT-OFF BAND SAW Offers New Design Features



● Truly a finished machine tool, the Famco "612" Metal Cut-Off Band Saw cuts all shapes, all types of metals. It's ruggedly built of semi-steel castings and alloy steel. Cast aluminum guards provide extra safety. Capacities up to 6" round and 6" x 12" rectangular stock. Made in the typical Famco tradition of "the highest quality machine for the money."

A Few Famous Famco Features

Open construction for easy access; microset stock stop for quick setting, precision sawing; $\frac{5}{8}$ " x .032 blade; coolant system added in a jiffy; improved design means easier blade changes; Timken roller bearing equipped transmission; quick setting guide arms; blade guard telescopes automatically; 50, 100, 175 and 300 FPM cutting speeds; vise jaws adjust to 45° angle.



Write for Free Catalog

Complete information, including models, specifications and new design features, is available in a new illustrated catalog. Send for your copy today!

FAMCO MACHINE CO.

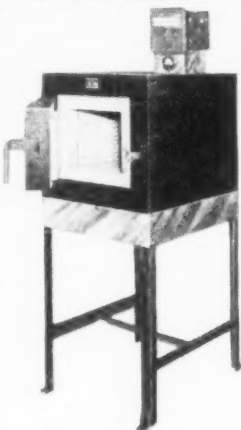
1320 18TH ST., RACINE, WIS.

famco COST CUTTING machines

ARBOR PRESSES • DRILL PRESSES • METAL CUT-OFF SAWS
POWER PRESSES • FOOT PRESSES • SQUARING SHEARS

LUCIFER HEAT TREATING FURNACES

A completely new line of Lucifer Electric Heat Treating Furnaces has been introduced by Gilbert Simonski. The new line, designated as model 7055, is available in four different sizes, namely: 6x6x12", 9x9x18", 12x12x24", and 18x18x36".



The feature of these furnaces is that the buyer can purchase a basic furnace and at any time desired, purchase such controls as would fit into his needs, without discarding any previously acquired pieces.

All units are floor models, constructed of heavy section angle iron electrically welded. They feature a minimum of 5" of refractory insulation and four different types of refractory for economy and outstanding performance. The standard models have a temperature range up to 2000°F., and the H-7055 series has a temperature range up to 2300°F.

Literature on the 7055 series, as well as other models, is available by writing the manufacturer: Gilbert S. Simonski, 401 N. Broad St., Philadelphia 8, Pa.

FLAME DETECTOR PREVENTS EXPLOSIONS

A fool-proof flame detector which eliminates previous limitations in electronic safeguards for many processes where oil or gas fired burners are used has been developed by Minneapolis-Honeywell Regulator Company.

The device, called the Protectoglo, operates on flame rectification principles. It makes use of the fact that either a flame, or a photocell sighted at a flame, is capable not only of conducting an electric current, but of rectifying an alternating current. The system applies alternating current either to a flame-electrode immersed in the flame or to a photocell sighted at the flame.

The new device meets the latest A.F.M. and Underwriters' Laboratories requirements. It provides instantaneous response to flame conditions, preventing a discharge of unburned fuel to combustion

chambers, and incorporates an automatic check of its own components; it will also shut off the fuel supply in event of failure.

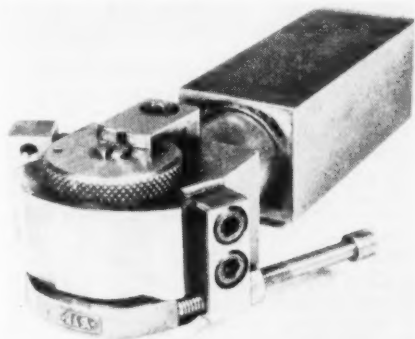
The Protectoglo system can be interlocked with any needed combination of control devices and accessory equipment, such as excess-pressure, low-pressure and low-water safety cutoff, temperature control, alarms, signal lights, etc. It can be used for single or multiple burner installations. For complete information, write **Minneapolis-Honeywell Regulator Co.**, Minneapolis, Minn.

AUTOMATIC MARKER FOR PRODUCTION PARTS

A new automatic marking device, the Automarx, which roll-stamps part numbers or trade marks on metal parts as they are processed in multiple spindle screw machines, has just been announced by The Special Screw Products Co. The device marks each part clearly for easy identification, while eliminating the need for a separate stamping operation.

Designed for mounting between positions on the machine, the Automarx leaves all stations free for processing. An adjustable head permits quick settings

for round stock (brass, steel, duralumin, etc.) $\frac{1}{4}$ " diameter and larger, while a removable roll-stamp enables the markings to be quickly changed, for different parts. This also permits regulating the

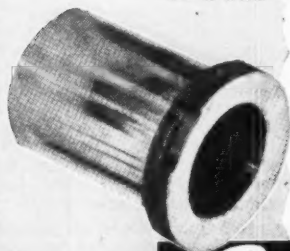


depth of imprint. The Automarx uses up no production time of its own, since it marks as the machine indexes.

For complete details, write **The Special Screw Products Co.**, 5445 Dunham Rd., Bedford, Ohio.



You're a Production Winner with *Economy* Drill-Jig Bushings and Gages



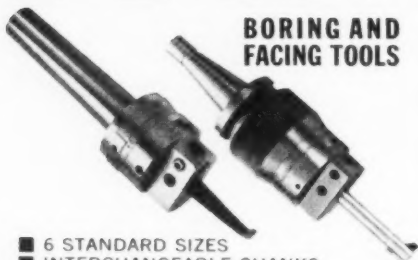
Yes, they're in stock, ready to go out to you — all A. S. A. standard types and sizes. You can also get fast service on new gages or gages salvaged by hard chromium plating . . . precision-finished, durable. Write for bulletin and price list.

***Economy* TOOL & MACHINE CO.**

1829 SOUTH 68th STREET • MILWAUKEE 14, WISCONSIN

MAX-WELL-MADE E-Z SET

**BORING AND
FACING TOOLS**



- 6 STANDARD SIZES
- INTERCHANGEABLE SHANKS
- TOOL STEEL CONSTRUCTION
- CAPACITIES UP TO 20 INCHES
- BORING BARS UP TO 1½ INCHES
- FINE MICROMETER ADJUSTMENT
- PRICES INCLUDE SHANK AND BARS

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THE MAXWELL CO.

221 BROADWAY • BEDFORD, OHIO

USE ECONOMY

Headless
Set
Screws



Socket
Set Screws

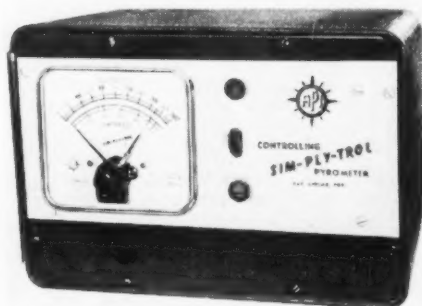
Try Them On Your Next Job!

**ECONOMY
MACHINE PRODUCTS
COMPANY**

5212 Lawrence Ave., Chicago 30, Ill.

AUTOMATIC CONTROL HAS MANY APPLICATIONS

The new Simplytrol Automatic Controller is used for controlling a variety of processes and operations. The Contact Meter-Relay indicating and controlling unit is available in all ranges of voltage and current. In the more sensitive ranges, it is responsive to changes of one-half microampere or a fraction of a millivolt. When calibrated in millivolts and furnished with dial graduations marked in degrees of temperature, it makes an easily installed, accurate pyrometer control, the manufacturers claim.

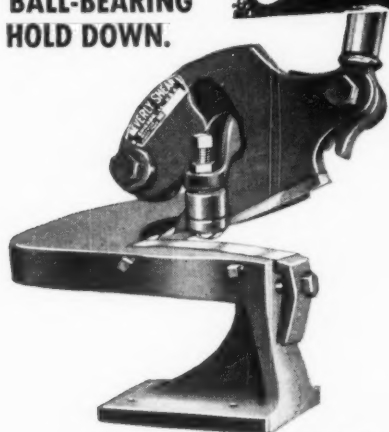


By using instrument rectifiers and current transformers, the Simplytrol will indicate and control alternating currents and voltages. Initial accuracy of calibration is better than 2%. Repeatability of the control point is better than 1%.

The Simplytrol Automatic Controller consists of a contact meter-relay with built-in micro-contacts, (patent applied for), and load relay rated at 15 amperes, 115 volts, 7½ amperes, 230 volt load. There is also an interrupter relay for the micro-contact locking circuit. All relays have snap action switches for positive contact. An isolating power transformer with 110 and 220 volt connections, rectifier and filter system to supply power for the relays is included.

The Simplytrol has also been employed to protect motors from low line voltage and from overload, to measure and control speed with tachometer generators and to light signal lamps or ring alarms in controlled processes. It may be used in place of electronic equipment for sorting and gauging operations. The Simplytrol is made by **Assembly Products, Inc.**, Main at Bell St., Chagrin Falls, Ohio.

**MODEL
B-3
WITH
BALL-BEARING
HOLD DOWN.**



Beverly THROATLESS SHEAR
Cut any Shape... **STRAIGHT OR
IRREGULAR**

You can make straight or intricate cuts in the lightest metals without distortion, yet handle heavier gauges with ease on a Beverly — "the Shear that experience built and performance made." Smooth, powerful, clean-cutting action of the Beverly have made it the preferred shear wherever metal is cut. Ask your Dealer to show you these superior metal cutting tools . . . or write for more details and illustrated circular.

Made in 4 sizes to handle 18 ga., 14 ga., 10 ga., and 3/16" mild steel. H.C.H.C. blades available for cutting stainless steel.

BEVERLY SHEAR MFG. CO.
CHICAGO 43, ILLINOIS

3005 W. 111th STREET

JIFFY *Carter* TIRE

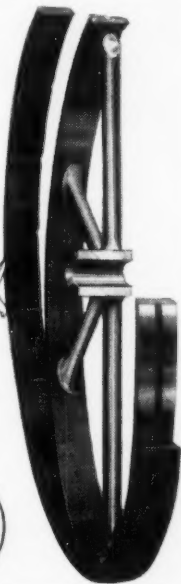
**Answers ALL Your
Bandsaw Tire Problems!**

*THAT'S NOT IDLE TALK BOYS!... THIS IS THE MOST OUTSTANDIN' CHANGE
THAT'S HIT THE BANDSAW INDUSTRY SINCE THE CARTER, QUICK-CHANGE
TIRE WAS INVENTED, 20 YEARS AGO!... IMAGINE PUTTIN' ON A BANDSAW TIRE
WITHOUT GLUE, CEMENT, RIMS, BOLTS OR SPECIAL TOOLS!*

At last! The new "Jiffy Tire" is made in sizes to fit any bandsaw wheel! Goes on in less than 5 minutes! All you do is tap the wheel into the tire with a rawhide mallet.

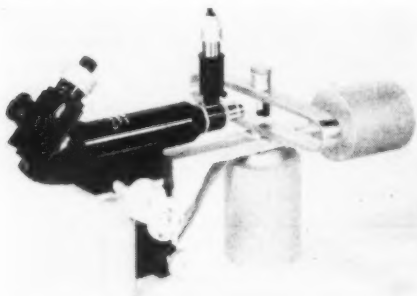
WRITE TODAY! . . . for your free, illustrated folder. Jiffy-Tires are available through the manufacturer of your bandsaw machines only.

Carter Products Company
960 Michigan Trust Bldg. Grand Rapids 2, Mich.



THE RINGTESTER FOR TESTING PRECISION INSTRUMENTS

A useful device which tests the precision of other testing equipment applying pressure or pull is the Z500 Ringtester, recently introduced to the United States. Basically, the Z500 consists of a flat, elliptical steel ring which, depending upon pressure or pull, is either compressed or extended. The deflection is measured by the filar micrometer eyepiece of the built-in microscope.



The precision microscope, manufactured by Leitz of Wetzlar (Germany), enlarges 50 times. It is directed towards an illu-

minated mirror showing the exact weight applied. The reading precision is 0.001 mm. (0.00004").

The Ringtester is claimed to offer the simplest and most rapid way to check whether another testing instrument is applying the correct pressure or pull to the material to be tested. Test rings are available for any weight from 30 kg. (approximately 66 lbs.) to 100 tons. The microscope can easily be detached and adapted to other test rings. To measure pull (rather than pressure), a special adapter is required.

For complete data on the Z500 Ringtester, write **P. T. I., Inc.**, 401 Broadway, New York 13, N. Y.

CRACK SEALER CUTS DOWN FUEL COSTS

Arno-Cord is a new improved crack-sealer for factory and home use for sealing windows, transoms, baseboards and holes against cold, and to stop drafts, heat losses, dust, dirt, etc. Self-sealing, it adheres to almost any surface and is applied simply by cutting off the length needed and pressing into place by hand. The material is non-drying and permanently pliable, and will not break or pull apart in application or removal.

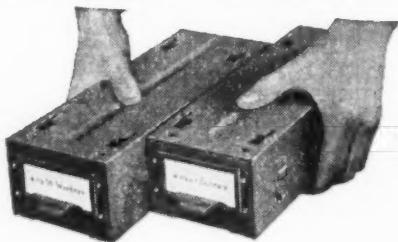
25% TAKE ADVANTAGE OF THIS PRICE REDUCTION

12 Large Multi Drawer Units

Size $11\frac{1}{16} \times 3\frac{1}{16} \times 3$ " **Now \$11.75**
deep, less than 12—99c each were \$1.29 each.

12 Small Multi Drawer Units

Size $5 \times 2\frac{7}{8} \times 2\frac{1}{4}$ " **Now \$3.50**
deep, less than 12—30c each were 40c each.



Solve Your small Parts Storage Problem with All Steel Multi Drawers. Easily assembled to fit any size or shape space. Positive, Rigid Interlocking.

If your local dealer cannot supply you send your order **DIRECT** with check or money order.

Jobber and Dealer Inquiries Invited

THE CINCINNATI VENTILATING CO.

INCORPORATED

Dept. B COVINGTON, KENTUCKY

MULTI

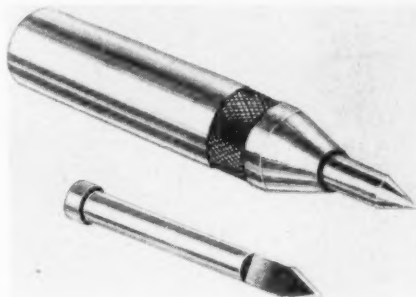
DRAWER

Arno-Cord is in the form of a tough 3-ply $\frac{1}{4}$ " cord, saturated with a moisture-proof wax compound containing inhibitors against rot, mildew and insects. It is supplied in 500-foot lengths on convenient 7-pound spools, which permits cutting to exact requirements without waste. On big sealing jobs, such as in industrial plants with hundreds of windows, the Arno-Cord spool can be strung on a tape and carried over the shoulder, leaving both hands free for easy handling. Arno-Cord is manufactured by The Longyear Co., New York, and is distributed exclusively by Arnaud Corporation, 17 John St., New York 7, N. Y.

SPRING SCRIBER CUTS SET-UP TIME, ELIMINATES ERRORS

The Craley Spring Scribe is a useful new tool recommended for die makers and other machinists who require an accurate scribing device. The scriber is hardened and ground, with an .1875" lapped hole to insure smooth action of the scribes. The holder measures approximately 2 $\frac{3}{4}$ " overall. Ground to .500" diameter for standard collet, the holder has two interchangeable high speed scribes. Both are ground at 60° angular points.

One scriber has a flat ground on the side for about $\frac{1}{2}$ " back from the tip and not quite to center, which aids in layouts to shoulders or stepped surfaces. The scribed lines are fine and very distinct. Lines can be scribed on contours as well as flat surfaces.



The Spring Scribe is claimed to eliminate errors by scribing lines on work on milling machines, saving time and errors. The set includes an extra scriber, as well as one with a flat side. For complete information, write C. E. Craley Tool Co., 110 Chestnut St., Shillington, Pa.

Libert **Hi-Speed** SHEAR

CIRCLE CUTTING
ATTACHMENT
Included as
STANDARD EQUIPMENT
with this Machine



MODEL
1236
36-in. throat.
12-gauge
capacity.

WRITE FOR
BULLETIN

SIMPLIFIES Maintenance
SPEEDS Production
SAVES Manpower

The *Libert* has amply proved its advantages by turning out top production—shearing flat or formed sheet metal, internal or external, plain or irregular shapes *rapidly, accurately, cleanly!*

Equally effective in maintenance work, *Libert* is cutting costs to rock bottom. Edges are smooth, need no finishing. Unskilled operators produce accurate work at once.

Sizes up to 60-in. throat, 10-gauge capacity.

LIBERT MACHINE COMPANY
Green Bay, Wisconsin

KIPP
Air Grinders



- FASTER SPEEDS
- BETTER RESULTS
- LOW PRICES

MODEL JA
50,000 R.P.M.

Weight 12 ounces; length 6 3/4 inches; chuck size 1/8 inch. Wheel guard removed for better illustration.

\$42
IN U.S.A.

THEY GRIND—NOT JUST RUB!

The RPM's stay up while grinding... not only when the grinder runs idle. It is an established fact that surface speeds must stay up to approximately a minute if you want to grind... not just rub. Every mechanic knows this, but an inexperienced buyer may order tools that maintain proper grinding speeds only when running idle. The speed of Kipp air grinders drops but slightly when put to work. That means better work... longer wheel life.

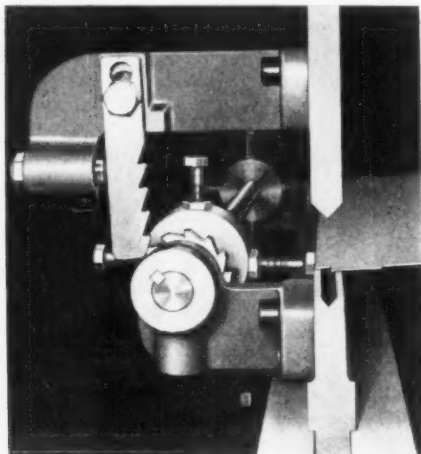
MADISON-KIPP CORP.

207 Waubesa St., Madison, Wis., U.S.A.

Write for KIPP Air Tool Catalog at 3006

AUTOMATIC GAUGE FOR PRESS BRAKES

The Humphrey Rodex gauge, an automatic, self-indexing rotary type gauge for press brakes, is said to make possible the producing of as many as four different bends in a piece of metal before it leaves the operator's hands. Ease of setting, accurate gauging and a saving of material handling time are claimed for the gauge.



The gauge consists of a rack and gear assembly which automatically rotates adjustable gauge stops into position, then holds them securely until the bend has been made. The rack, which is attached directly to the punch, engages the gears and on the upstroke, brings the stops into the position required for the bending operation. Provision is made for disengaging the rack from the gears to permit the use of the gauge as a single-stop gauge. Gauge stops are strategically located in the rotating member to meet most bending requirements. Write for complete details to **General Gas Light Co.**, 202 North Park St., Kalamazoo, Mich.

SCINTA METAL CUTTING BLADE

The engineering department of Scintilla, Limited, famous Swiss machinery firm, has recently developed a metal cutting blade to be used with the Scinta Electric Portable Hand Saw, of which several thousand are now in use in the United States. For complete particulars, write **R. Caluwaerts Co., Inc.**, 1 W. 67th St., New York 23, N. Y.

SET OF

14 Nicholson Mandrels

Takes Every Size Bore $\frac{1}{2}$ " to 7"



Actually 209 solid arbors would be required to fit all bores between $\frac{1}{2}$ " and 7", advancing by $\frac{1}{32}$ ".

But 14 Nicholson Expanding Mandrels would ac-

commodate this entire range, and all in-between sizes as well. Hardened

tool steel. Sold singly or in sets. The standard in shops the nation over.

BULLETIN 1043 shows how to save time, promote precision with these widely used tools.

W. H. NICHOLSON & CO., 117 Oregon St., Wilkes-Barre, Pa.

Steam & Air Traps - Control Valves - Expanding Mandrels - Arbor Presses - Welded Flats

BELOIT

★ COMBINATION
★ PUNCH, BAR SHEAR,
ANGLE SHEAR, AND
NOTCHER...

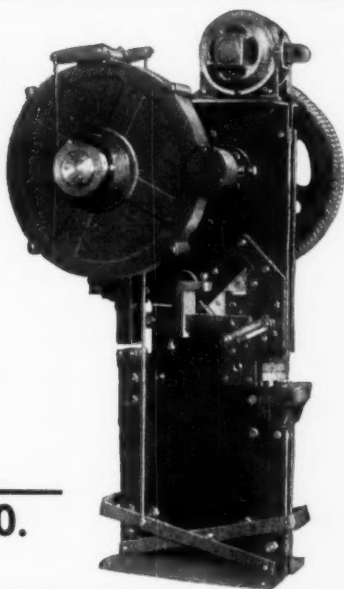
This combination machine will shear, mitre, notch and cope angles; shear flat and round bars; and punch up to the center of 10" without change of set-up.

Frame and lever are of heavy fabricated steel plates; machine cut gearing, four jaw dental type clutch, adjustable stop, etc.

Write for complete details.

HENDLEY & WHITEMORE CO.

100 BLACKHAWK BLVD.
BELOIT, WISCONSIN



**OUR
EFFICIENT
TOOL DESIGNING**

*means
better production
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

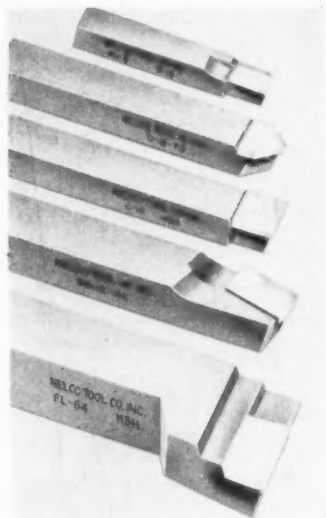
**COLUMBUS DIE TOOL
and Machine Co.**

930 CLEVELAND AVE., COLUMBUS 1 OHIO



NELCO CARBIDE TIPPED TOOLS

Nelco Tool Co., Inc. has announced a line of stress relieved carbide tipped tools. The tool is said to eliminate the brazing strains commonly present in conventional design brazed carbide tools, through the slashed mill design. Larger sizes, also slash milled, are brazed with a nickel or constantan shim between brazed surfaces. The tip is brazed to one surface only, not three, as in conventional design tools. This minimizes brazing strains, thereby eliminating grinding cracks and tool breakage, caused from stresses in the tool.



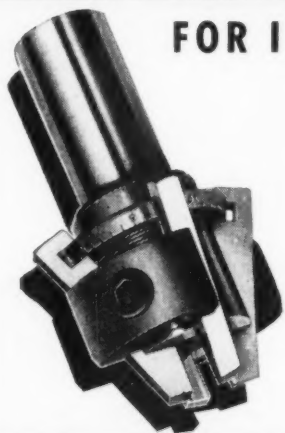
All Nelco carbide tips overhang the steel shank, thus allowing several regrinds before the steel itself must be ground. This feature saves regrinding time and also saves diamond wheels since no steel is ground. The slash milled design allows the tools to be made so that the overhang has no detrimental effect on the operation of the tools.

The tools are manufactured in all standard grades of carbide and are available either milled and brazed (consumer finish grinds tool) or finish ground from the company or its distributors. **Nelco Tool Co., Inc.** Manchester, Conn.

Air-conditioning equipment on a Pullman car enables the air in that car to be completely changed every 6½ minutes.

KUTMORE ADJUSTABLE HOLLOW MILLS

FOR INCREASED PRODUCTION

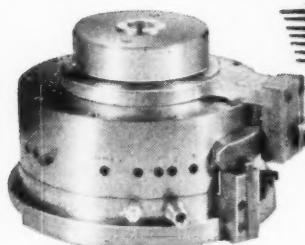


- Exclusive micrometer adjustment feature for rapid set up.
- Adaptable to multiple operation work.
- Cutting capacities from 1/32" to 2" diameters—also available in larger diameters on special application.
- Blades quickly resharpened in complete sets with Kutmore Fixture.

Write for Catalogue No. 20-MM

OUR ENGINEERING DEPARTMENT IS AT YOUR DISPOSAL ON YOUR HOLLOW MILL PROBLEMS

CARL WIRTH & SON, INC. 1625 CLINTON AVE. NO. ROCHESTER 5, N. Y.



RC-5



Index Chuck with Air Operated Collet

The REDMER INDEX CHUCK has twelve indexing positions and Collet capacity 1/16" to 2". REDMER CHUCK can be had with either Index Collets or Standard Brown & Sharpe type collets.

No. FC-28

V-29

Air Foot Control and Valve

The REDMER FOOT CONTROL & VALVE was developed in order to meet a demand for an AIR VALVE & FOOT CONTROL LOW IN COST but constructed to surpass the high priced Valves.



REDMER AIR DEVICE CORP.

GUNTERVILLE, ALABAMA, BOX 247

Engraving

PROFILING VERTICAL MILLING



Dies



Displays



Signs



Panels



Name Plates

Here is the most versatile machine... So simple to operate by unskilled labor.

NEW HERMES

Engraving

This heavy duty bench type model covers a larger engraving area than any other machine of its kind.

Send for illustrated booklet H



NEW HERMES, Inc.

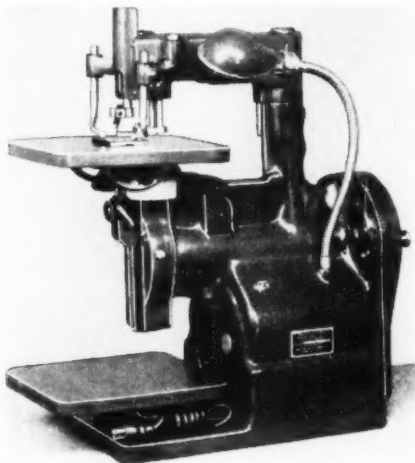
DEPT. 28

13-19 UNIVERSITY PL. • NEW YORK 3

World's Largest Manufacturer
of Portable Engraving Machines

IDEAL DIE AND PUNCH FILING MACHINE

Ideal Tool and Die Co., Inc., manufacturers of precision machine tools, have recently introduced their improved Model S-1 Synchronized Punch and Die Filing Machine. This interesting new unit incorporates several novel features. The height capacity for die thickness has been increased to 2½" as standard capacity.



However, the manufacturer will furnish the unit to accommodate greater thicknesses of dies or tools, ranging up to 4" in thickness, upon special request.

The machine is equipped with a variable speed drive, giving any speed range from 200 to 500 strokes per minute. The speed changes are accomplished by a variable pitch pulley of the manufacturer's design and construction, mounted on the motor shaft itself. This variable pitch pulley unit is equipped with a dial which, when turned to the right, increases the speed of the machine in strokes per minute. When the dial is turned to the left, it reduces the speed. The dial is conveniently located in the rear of the machine by projecting through an opening in the door, so that the door need not be opened for speed adjustment.

An air pump driven by the same motor which powers the machine drives up to 15 lbs. air pressure through a flexible metallic hose which can be bent to any desired position for blowing the chips clear from the work.

Standard features include an adjustable stroke from 0 to 1½", a compound tilting

die table with degree graduations, a retractable file holding chuck which retracts the files or saws below the die and die table for inspection purposes or when removing the die from the machine. Two hold-down fingers attached to a swinging arm permit a wide range of maneuverability. Saw guides and interchangeable hardened saw guide inserts are furnished above and below the die table for sawing.

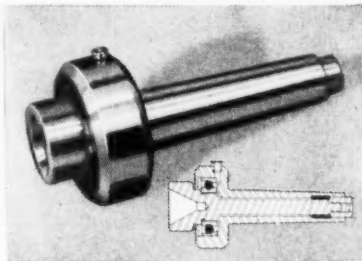
For complete features and information, write **Ideal Tool & Die Co., Inc.**, 733-735 Congress St., Schenectady 3, N. Y.

LIVE CENTER FOR CENTERLESS SHAFTS

A new female live center designed especially for supporting centerless shafts is now offered by the South Bend Lathe Works. The 60° cup receives the shaft end, as shown in the cross section drawing below. Two sizes are available, one with No. 3 Morse taper shank and maximum work capacity of 1", and the other with a No. 2 Morse taper shank and ¾" work capacity. Both sizes will take work diameters down to 5/16".

The revolving center is made from electric furnace steel heat treated to a hardness of 61 to 65 Rockwell C. The center shaft extends through the taper shank and is rigidly supported at both

ends. A specially designed precision ball bearing carries both the radial and thrust loads of the work, and a plain pilot bearing eliminates center shaft whip. All parts are replaceable in event of damage.



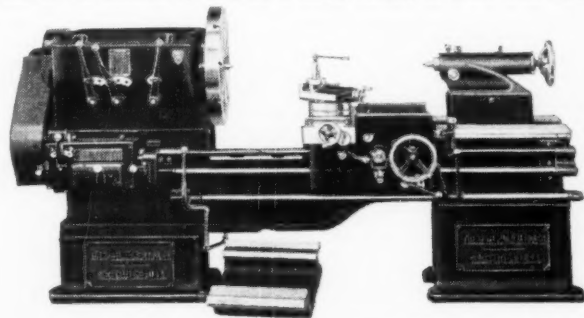
Additional information on this female live center is available from the **South Bend Lathe Works**, 426 E. Madison St., South Bend 22, Ind.

I. C. Raymond Atkin, Short Hills, N. J., was elected a Director of Johns-Manville Corporation, New York, by action of the Board of Directors, it was announced recently by Lewis H. Brown, Chairman.

NEBEL Removable Block Gap Lathes

furnished in the

Geared Head Motor Driven Type, 3 Step Cone Double Back Gear Belt Driven Type or with Motorized Headstock. Especially adapted for repair and maintenance as well as for general manufacturing. Handle a large variety of work with large swing through the gap.



All Geared headstock type completely equipped with Timken Bearings, with motor mounted on rear of lathe. Quick change gear box, compound rest, steady rest, chasing dial, face plate, driver plate, wrenches, tool post and centers.

Furnished in four different sizes as follows: Series "LN" 18/27", Series "A A" 20/30", Series "B" 22/33", and Series "D" 25/40".

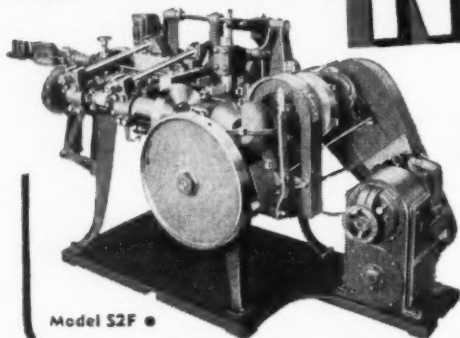
Write for Circular
Giving Complete
Information

THE NEBEL MACHINE TOOL COMPANY

CINCINNATI 25, OHIO

There's Nothing like a

NILSON



Model S2F •

For
Rapid Production

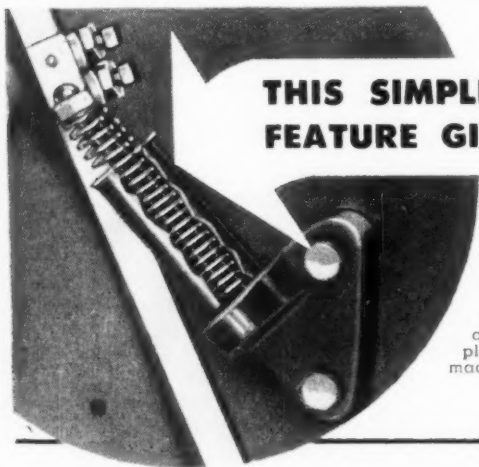
• **Combination Press and 4-Slide Forming Machine**

Extra rigid construction; tooling costs are generally lower; forming tools are interchangeable and easy to adjust. Send for catalog.

A. H. NILSON MACHINE CO.
BRIDGEPORT 5, CONN.

SPECIALISTS IN WIRE FORMING EQUIPMENT FOR OVER 50 YEARS

Automatic Wire and Metal Forming Machines • Staple Forming Machines • Chain Making Machinery • Foot and Power Presses • Wire Reels • Wire Straighteners.



**THIS SIMPLE, SURE-ACTION
FEATURE GIVES EXTRA SAFETY**

JOHNSON puts the exclusive **SAFETY TRIP** on all models of Power Presses at no extra cost! This patented non-repeating device uses two springs to hold release lever up. If one fails, the other takes over. If both fail, clutch automatically disengages. Springs replaced in 30 seconds without stopping machine.

Johnson

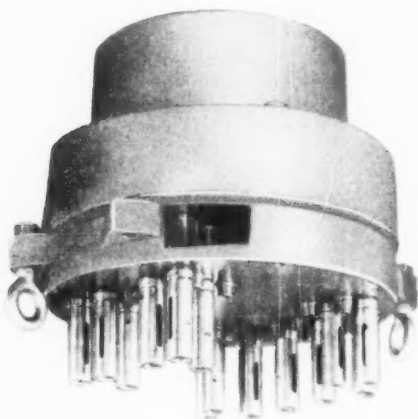
**MACHINE
and PRESS CORP.**

620 W. INDIANA AVE • ELKHART, IND

IF YOU THINK SAFETY FIRST, think first of Johnson. Write for information on 8 models of open-back inclinable Power Presses now available. Ask about the new extra capacity, extra power No. 55 Press.

HERZBERG MULTIPLE DRILL AND TAPPING HEADS

The Multiple Drill and Tapping Heads manufactured by Herzberg-Gruber Corporation feature dependable performance and economical lay-out changeover. The multiple spindles are precisionally located and remain the same as long as the set-up is desired. The unit is completely mechanical, with positive gear drives to each spindle. The precision location of these spindles does not depend upon the operator's locating holes to be drilled or tapped. Complete change-over time is cut to a minimum.

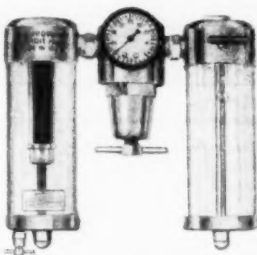


The Drill Head is built ready for installation on drilling machines in a short time. It is stated to do an economical job of drilling, tapping, reaming, spot-facing, boring, counterboring and milling.

The Herzberg Head is provided with an unlimited number of spindles; it has, however, single spindle adjustment with adjustable tool adapters. It can be used on any number of jobs using the same head and spindles. The tapping heads with individual lead screw spindles take the responsibility from the operator during the tapping cycle, thus damage to the spindles by tapping location is practically impossible.

All Herzberg Heads have full automatic lubrication for either horizontal or vertical type drilling machines. For complete information, write for illustrated folder to **Herzberg-Gruber Corp.**, 631 E. Center St., Milwaukee 12, Wis.

"M-B" AUTOMATIC *Air Line* FILTER, REGULATOR and LUBRICATOR ASSEMBLY



"Sentinel
of the
Air
Line"

FILTER element removes solids .00039 and larger. TRANSPARENT BOWL provides visibility. REGULATOR is capable of passing large volume with an unrestricted flow and minimum amount of pressure drop. Self-bleeding, compact, simple. Machined from bar aluminum. LUBRICATOR delivers desired volume of oil. Adjustable Venturi Valve permits efficient operation on broad range of volume and pressure. Bowl can be refilled without shutting off air supply. Any of these 3 devices can be used as separate units or in any combination.

Also "M-B" PNEUMATIC GRINDERS

*Remember, Quality Remains long
after First Cast Disappears*

See Us at Booth 642,
A.S.T.E. Show, Philadelphia,
April 10-14.

Write for Literature

M-B PRODUCTS
130-134 E. Larned St.
Detroit 26, Mich., U.S.A.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK



INSIDE MICROMETERS

Measure: "O" Ring Grooves
Snap Ring Grooves
From 1/2" to 12"

Write for Information

RIMAT MACHINE TOOL COMPANY
1123 AIR WAY GLENDALE 1, CALIF.

RIVETING?

use

LINLEY Noiseless Riveting Machines

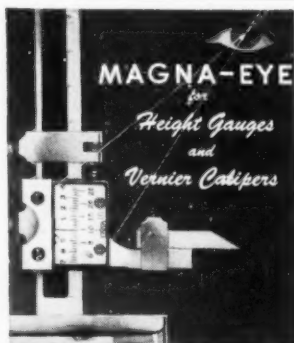


Sturdy, fast, easily operated! Put your production rivet spinning jobs on Linley Riveting Machines and watch your costs come down.

We are glad to demonstrate the quality of work that can be turned out. Send us samples of your parts and you'll be impressed with what you can do and how little it will cost you. Sizes and types available for iron or cold rolled steel rivets up to 3/4" with capacity for larger rivets of softer materials.

Send for descriptive bulletin R.

LINLEY BROTHERS CO.
673 State St. Ext. Bridgeport 1, Conn.



MAGNA-EYE

for
Height Gauges
and
Vernier Calipers

MAGNIFIES VERNIER SCALES

The "hard-to-read" Vernier scales on height gauges and calipers can NOW be read with ease. No more eye strain! No more guess work, "hit and miss" in setting and reading these accurate instruments.

The lens is fine quality optical glass, specially designed and precision ground with utmost optical skill. Four times magnification shows lines true and correct with power to "BREAK" thousandths into "tenths" with ease. In three sizes.

Buy Through Your Distributor

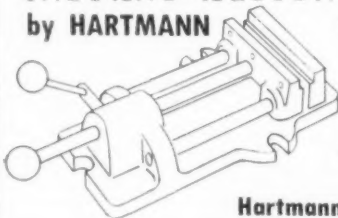
For Complete Information Write To

STEBAR COMPANY
715 W. Lake Street, Minneapolis 8, Minn.

INSTANT ACTION RAPIDSET

by HARTMANN

All Purpose Tool Room and
Machine Shop Vises.

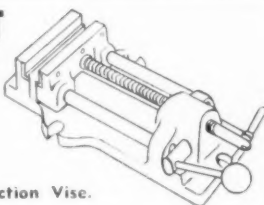


The JAWSET

Adjustable Pressure Production Vise.

For Information Write Dept. M

Hartmann Mfg. Co., 1637 Goult St., Racine, Wisconsin



WE SERVICE



Micrometers
Verniers
Gear Tooth Verniers
Adj. Snap Gauges
Indicators



Height Gauges
Squares
Bevel Protractors
Carbide Tipping



USING STANDARD PARTS — ONE WEEK SERVICE
ONE PURCHASE ORDER COVERS ALL MAKES

DIXON AND RYAN CO.

311 S. TROY EST. 1926 ROYAL OAK, MICHIGAN

Eagle Electric Mfg. Co., Long Island City, N. Y. announces the appointment of **Philip Wienick** as its representative in the Chicago area, with headquarters at 627 W. Jackson Blvd.

Size Control Co., and Walsh Press & Die Co., divisions of American Gage & Machine Co., have opened new offices at 3344 West 105th St., Cleveland, Ohio, with **Hugh G. Collins** and **Wallace W. Denhoff** in charge of sales & service in the state of Ohio.

Another appointment for metropolitan New York has been made by Size Control Co. with **Joseph A. Battle & Co.** as its exclusive representatives.

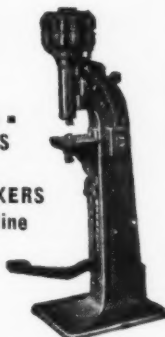
Appointment of the **Geoffroy Company**, Denver 6, Colorado, as sales engineering representatives for Colorado, Utah and Wyoming has been announced by **Ralph G. Lagerfeldt**, vice-president, Colonial Broach Co., Detroit, manufacturers of broaches and allied equipment.

Geoffroy will also handle products made by Colonial Bushings, Inc., Detroit, and New Method Steel Stamps, Inc., Detroit.

GRANT

RIVETERS...

PIONEERS
and
PACEMAKERS
in their line



—head rivets from smallest to $\frac{3}{4}$ " diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.
C E Station, Bridgeport 5, Conn.



CLOSED

TRADE

AUTOM

CLOSED

MARK

Plain Type

Offset Type

CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

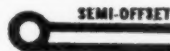
**AUTO Moulding
& MFG. CO.**

1110 E. 87TH ST.
CHICAGO 19, ILL.

SPECIFICATIONS:
Open Width $\frac{1}{4}$ " to 6"
Gage Material .040 to .125
Pin Diameter .101 to $\frac{3}{4}$ "
Lengths to 120"



THREE-FOURTHS OFFSET



SEMI-OFFSET



The
**Lubri
King**
UNIT

**DRILL PRESS, TAPPER,
MILLING MACHINE, PROFILER, BENCH**
*Puts the Right Amount of Coolant Where,
and When, You Want It!*

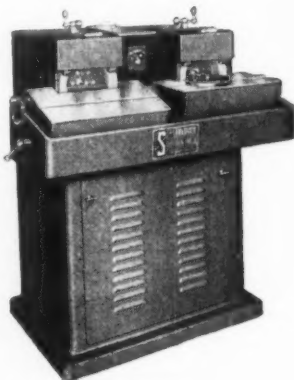
Foot Power Pump eliminates oil cans and brushes . . . delivers as much or as little fluid as you want exactly where and when you want it . . . speeds work by freeing both hands. Easily portable, attaches quickly to any machine.

\$29.50 Complete with 2 gal. tank, built in foot pump,
F.O.B. 5 ft. oil resistant plastic hose, nozzle, bracket,
MINNEAPOLIS 50 mesh screen. Return hose Extra.

Write for Descriptive Bulletin or Order One Today From

W. A. HOREJSI COMPANY

2001 James Ave. N. • Minneapolis 11, Minn.

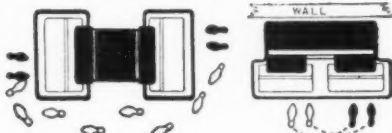


Type 10TD
Twin Wheel
Tool Grinder

FROM ROUGH TO FINISH GRIND IN ONE STEP

**HEAVY DUTY - WET OR DRY
10" - 14" WHEELS**

PROMPT DELIVERY



OLD WAY

Lost time between rough and finish grind.
Floor space wasted —
Grinder must be away from wall.

NEW WAY

One step from rough to finish grind.
Conserve floor space —
place Grinder against wall.

See this machine in operation at Booth 965, A.S.T.E. Show, April 10-14, 1950 in Philadelphia, Pa.

Bulletin 18 Is Just Off The Press! Write Today!

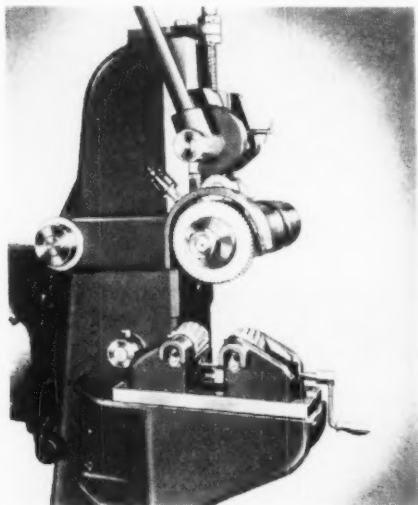
THE STANDARD ELECTRICAL TOOL CO.

2486 RIVER ROAD

CINCINNATI 4, OHIO

PIPE DE-SCALING AND CLEANING ATTACHMENT

An ingenious device for removing scale, rust, concrete, old paint, etc., from pipes and tubes, has recently been introduced by Continental Machine Company. This de-scaling and cleaning attachment is recommended for cleaning materials used in fabricating columns, posts, pipe lines, etc. Sizes are available which will accommodate pipe up to 12" in diameter.



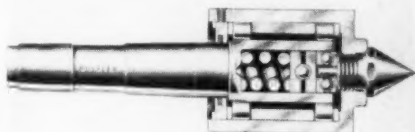
The attachment can be installed on the Steen Cut-Off Machine in just a few minutes, on the job, by a plant's maintenance department; only two bolts need to be loosened. The unit can again be changed back for ordinary cutting operations.

Only one pass through the work rolls is required, and the work is perfectly cleaned, Continental states. Feeds up to 20 feet of pipe per minute make the device useful for production work as well as for intermittent use. In operation, the large upper roll (see picture) serves as the drive, while the two lower rolls feed the pipe through, automatically.

The Continental De-Scaling and Cleaning unit is furnished complete with upper drive roll and lower rolls with roller bearings, hardened pins and lower roller blocks attached to the base plate. For complete information, write **Continental Machine Co.**, 1952 Maud Ave., Chicago 14, Illinois.

BULTOOL IMPROVED LIVE CENTERS

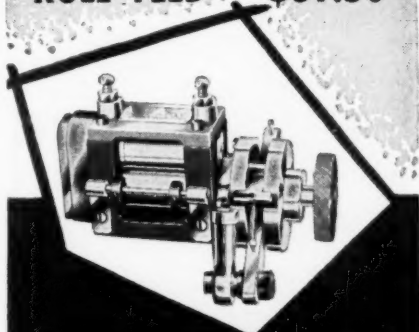
The Bultool Company, consulting and manufacturing engineers of precision heavy duty mechanical equipment, have given notice of several important improvements in their line of live centers.



The radial and thrust load capacities have been increased from 25% to 300%. The head diameters of the centers have been reduced substantially in order to reduce tool interference and thereby permit closer mounting of tools. Points are now being ground by a new process (patent pending) which is stated to assure far greater accuracy than was obtainable by former methods.

Complete data is available from the manufacturer: **The Bultool Company**, 715 Latham Square Bldg., Oakland 12, Calif.

A REALLY VERSATILE ROLL FEED \$89.50



Quality built for long, dependable service. Models available to fit all size power presses.

Write today for circular and prices.

ROLL FEEDS CORP.
PAWTUCKET • RHODE ISLAND

IT'S ACORN Banded THRUST BEARINGS



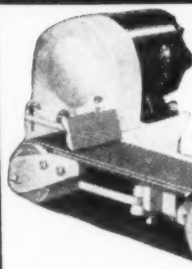
**REGULAR
OR
SPECIAL
DESIGN
TO
25" O.D.**

For Quality, Dependability and Price

We also make Thrust Bearings interchangeable with other manufacturers. We take in extra work on Blanchard Grinders.

Thrust Bearings Specialists
For Over 30 Years

ACORN BEARING CO.
68 Stanley St., New Britain, Conn.



STANDARD D-4 Abrasive Band Grinder

**Famous
for
Stamina**

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

**OTHER STYLES AND SIZES IN NEW
MANUAL ON FINISHING—WRITE TODAY**

WALLS SALES CORP.

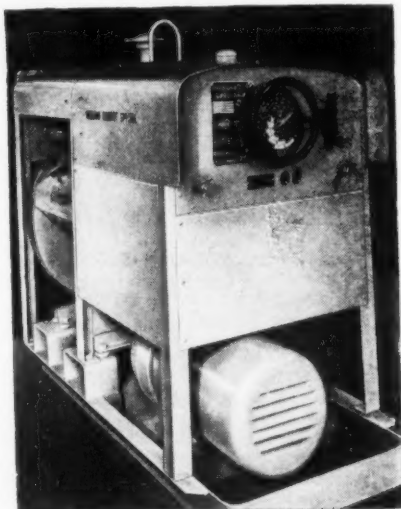
306 E. 38th St., New York 16, N. Y.

AIRCO 200-AMPERE MACHINE-DRIVEN ARC WELDER

Air Reduction, manufacturers of industrial gases and welding equipment, announce their new 200-Amp. Hornet "Special" arc welder. This machine combines the compact 36A generator with a four-cylinder, 31 h.p., air-cooled Wisconsin engine.

The 36A generator has a welding range from 40 amperes at 20 volts to 250 amperes at 40 volts. It is built as a two-bearing unit. Closely spaced precision bearings provide maximum load safety. Double shields keep bearings dirt-free and hold grease in.

The control wheel mounted on the panel shows accurate current markings which are obtained by setting the pointer located in the center of the wheel. This hand wheel has five positions, with ample overlap to insure fine settings from minimum to maximum output of the machine. The need for meters is eliminated.



The 36A is a self-excited generator with excitation of the main field supplied by an auxiliary brush, insuring instant recovery voltage over short circuit. Welding terminals are readily accessible, with ample space between them to prevent accidental shorting of welding cable lugs.

The air-cooled Wisconsin engine has magneto ignition with impulse starting.

Immediate Delivery FROM STOCK

GREAVES-SILENT BAKELITE GEARS



No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads... their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time... Money... Labor!

We also make silent gears of rawhide and Fabril.

Write for Circular.

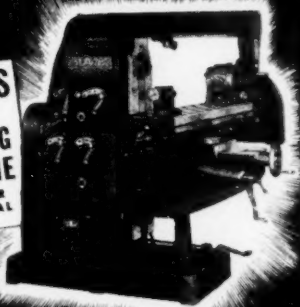


Greaves MACHINE TOOL CO.

2013-18 Eastern Ave.
Cincinnati, Ohio

BUILT RIGHT! PRICED RIGHT!

GREAVES
No. 2-H
MILLING
MACHINE
PLAIN OR
UNIVERSAL



Simple in design. Easy to operate. Rigid construction including every worthwhile modern feature of milling machine development. With 18 spindle speeds (20 to 1000 R.P.M.) both the universal and plain millers are readily adaptable for heavy duty or light precision production work. Send for bulletin.

SEND
FOR
BULLETIN
AND
PRICE
LISTS

Greaves MACHINE TOOL CO.

2013 Eastern Ave.
Cincinnati, Ohio

Hand cranking eliminates battery maintenance. The steel core vee belt coupling permits running of both generator and engine at speeds which afford the most economical and efficient operation. The manual slow-down control effects considerable savings of fuel. The Hornet "Special" is 58½" long, 25½" wide, 47" high and weighs 825 lbs. It comes equipped with a full-length drip-proof canopy. Two-wheel, trailer type running gear, with 4-ply pneumatic tires and a 38" long drawbar, is available as optional equipment.

Air Reduction, 60 East 42nd St., New York 17, N. Y.

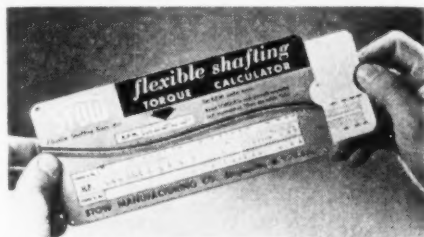
What Do You Know?

Answers to Quiz from Page 118.

1. False
2. False
3. True
4. Shear Blades
5. England
6. Keep tool cool
7. Removing dull abrasive grain
8. 1.74
9. 1917
10. Broach

SLIDE RULE CALCULATES TORQUE LOADS

A new "on the job" slide rule for calculating torque loads on flexible shaft equipment has been developed by Stow Manufacturing Co. This pocket size calculator is especially useful in that it solves torque problems and indicates the size of the shaft which performs most efficiently at a given r.p.m., within a given radius.



This handy device is available to design engineers and business executives who are confronted with power drive problems. A flexible shafting torque calculator may be obtained by writing, on company letterhead, to Stow Manufacturing Co., Binghamton, N. Y.

BUY the ECONOMY WAY Walton Tap Extractors Come in Six Standard Sets

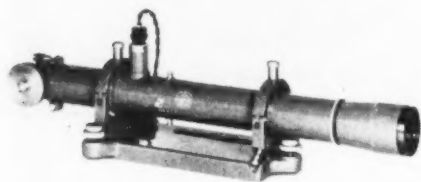
Save money by buying your extractors in sets — and get at no cost a sturdy metal compartment box to keep them in. Walton Tap Extractors are those handy, special tools for removing broken taps. If you haven't tried them, order from your dealer today, or write for folder No. 12 and details of free trial offer.

The WALTON Company
HARTFORD 10, CONNECTICUT



NEW DEVICE TESTS ALIGNMENT TO GAGE BLOCK ACCURACY

The Watts 18" Auto-Collimator introduces methods successfully employed in the optical industries to the machine tool and engineering field.



The instrument produces a beam of parallel (collimated) rays of light and measures to the accuracy of $\frac{1}{2}$ second of arc, any deviation, between the original direction of the beam and its reflection by a mirror or polished surface.

It is, for example, possible to produce a chart showing waviness in a surface

plate, machine bed or shaft, to an accuracy of better than .00004". With the use of simple accessories such as gage blocks, angle gage blocks, reflecting squares, mirrors, etc., a large number of precise angular measurements can be taken directly.

Linear measurements can be determined by a simple computation without regard to distance and without wear, distortions due to temperature changes, or other factors normally affecting accuracy of measurement and inspection.

This instrument is a useful piece of equipment for the gage laboratory and tool room and in the shop when machining and assembling large units which require accurate alignment.

The Auto-Collimator is distributed exclusively in the United States by **Engis Equipment Co.**, 431 S. Dearborn St., Chicago 5, Ill.

William H. Kingsley has joined the Fairbanks-Morse organization as manager of the Electrical Division, with headquarters in the firm's executive offices in Chicago.

USE "NIROL" LIVE CENTERS — HERE'S WHY:

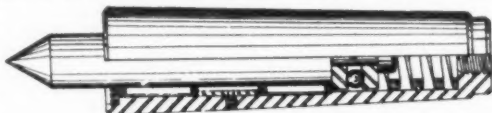
It's a rugged, simplified designed precision live center permitting perfect support of all loads and thrusts. Reduced overhang adds rigidity and increases machine capacity. Compensating factor provided for work expansion from heat while machining.

Has met with hearty approval of all machinists and shop men wherever used.

Morse Taper Sizes:

No. 2	\$21.75
No. 3	26.75
No. 4	32.50
No. 5	49.75

Other sizes and prices upon request



Patent Applied for

Increase
Production
SAVE TIME
SAVE MONEY

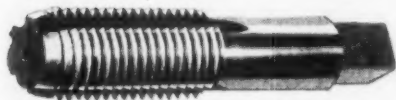
L. F. TREICHLER—PRECISION GRINDING

900 ROUTE 29

NORTH PLAINFIELD, N. J.

LEADSCREW TAP STANDS UP UNDER 500,000 TAPPINGS

A useful tool which was developed to meet a wartime problem encountered in tapping aluminum fuses, is a new long-life tap, introduced by Reasor Manufacturing Co. The tap was developed by W. B. Johnson, former night superintendent at Bastian-Blessing Co., Chicago.



The new tool was used successfully in the above plant for over two years. One tap is said to have made as many as 500,000 tappings in aluminum, and another, an equal amount in brass. In steel, cast iron, and copper, the amount of tappings has exceeded from 5,000 to 7,000 per tap, depending upon the hardness of the metal.

The tap's strength and longevity are accounted for by its construction. The wide land of the tap acts as a lead screw, serving to hold size in the tapping, and also giving a burnishing effect. The tap can be ground the entire length of the flute, and will still hold its size.

The tap is fully covered by patent, and is known as the "Leadscrew" Tap. For complete information on both carbon or high speed taps, varying from 20 to 8 t.p.i. in the NC type, and from 28 to 14 t.p.i. in the NF type, write Reasor Manufacturing Co., St. Charles, Ill.

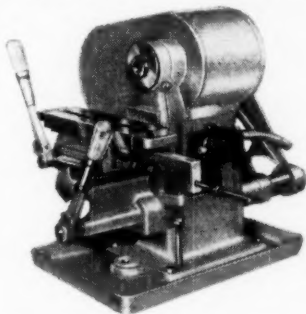
What Do You Know About Standards?

Answers to Quiz from Page 92.

1. External dimension
2. 65 degrees F.
3. Extreme of conical form
4. Flat
5. Screw threads
6. 16 teeth
7. 40 grit
8. Coke pig iron
9. 1500 degrees F.
10. 5500 r.p.m.

**THIS BURKE
BENCH MILLER**
COSTS only

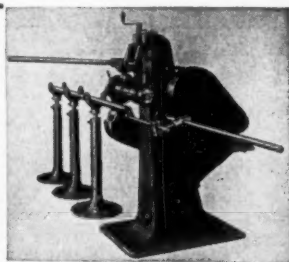
\$240
(less motor)



It's the little Miller with the big reputation for accurate work. For production, tool rooms, schools, hobbyists. Send for catalogue of hand and power feed models.

The BURKE MACHINE TOOL CO.

A Division of U. S. Burke Machine Tool Co.
20 East 72nd St. Cincinnati 16, Ohio



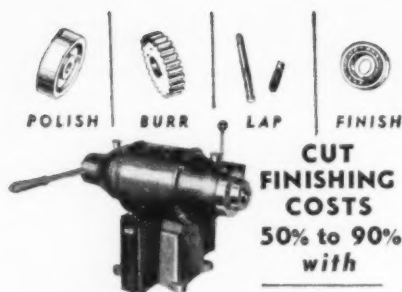
Faster TUBE & PIPE CUTTING

Steen High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters $\frac{1}{8}$ " to 3"; $\frac{1}{8}$ " to 6"; 3" to 12".

WRITE FOR CIRCULAR TODAY

Continental Machine Co.

1954 Maud Ave. Chicago 14, ILL.



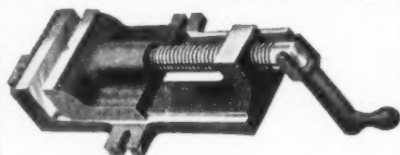
SCHAUER speed lathes

Users report: "We burr twice as many pieces per hour." "Speed Lathes cut polishing time in half!" Learn how you, too, can "Save with Schauer" on all your secondary finishing operations. Write for Catalog 480.

SCHAUER MANUFACTURING CORP.

• ORIGINATORS OF TODAY'S SPEED LATHES
2064 READING RD., CINCINNATI 2, OHIO, U.S.A.

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, Inches	Opens Inches	Weight Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

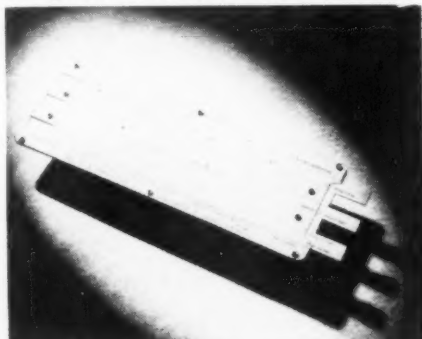
YOST MFG. COMPANY

1335 SO. MAIN STREET
MEADVILLE, PENNSYLVANIA

GRAY PLANER TIME CALCULATOR

An ingenious new device which is believed to be the first precision planer slide rule which has ever been produced has recently been introduced by The G. A. Gray Co., manufacturers of open-side and double housing planers and other machine tools. The planer slide rule quickly and accurately calculates the actual planing time for a planer equipped with a modern variable voltage drive.

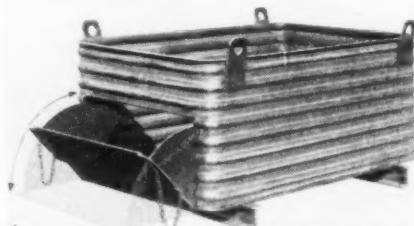
The calculator, made entirely of Vinylite plastic, is contained in an attractive plastic case with instructions for its



simple operation. The reverse side of the calculator features a useful planing speed and feeds chart for high speed steel and carbide tools. This handy device fills a definite need in the industry. For the price and further details, write to Graham E. Marx, assistant sales manager, The G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.

STACKING BOX WITH HINGED DOOR

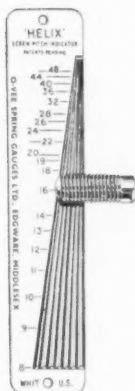
A new corrugated steel stacking box with a chain operated hinged door is announced by Palmer-Shile Company, man-



ufacturers of Material Handling Equipment. One of the convenient uses of the box is on a steel stand. The door may

be opened to any set angle by means of the chain, simplifying parts disposal by standing or sitting workmen. The door also eliminates the necessity of removing tiered boxes when it is desired to dispose of parts in boxes which are not at the top. The boxes are built to dimensions and load capacity specified by the customer, including underneath clearance. Crane lugs, stacking brackets, and color of paint desired may also be specified. **Palmer-Shile Co.**, 12648 Mansfield Ave., Detroit 27, Mich.

SCREW THREAD PITCH GAUGE



The "Helix" Screw Pitch Gauge is a useful device which provides a rapid means of determining the pitch or number of threads per inch of screw threads; it is stated to be an improvement over the conventional method of offering profile gauges of various pitches, one at a time, to the screw thread under examination.

The gauge consists of a plate, having formed upon it a number of grooves of screw thread form, varying in pitch from 48 threads per inch to 8 t.p.i., with a scale indicating the equivalent t.p.i. of various points along its length.

To determine the number of threads per inch of a screw thread, the screw is pressed firmly on the grooves at approximately right angles to the right-hand edge and drawn along the gauge until the pitch of the grooves coincides with the pitch of the screw. At this point, the screw will drop into engagement with the thread grooves with a distinct click, and the t.p.i. can be read on the scale immediately below the center line of the screw under test. As an alternate method, the gauge can be held at eye level and the precise point where the screw thread sits snugly in the grooves can be easily observed.

Two types of the "Helix" Screw Thread gauge are available: the Ref. H.1, for metric threads of from .5 mm. to 3.0 mm. pitch, and the Ref. H.2, for Whitworth & U. S. threads, 48 to 8 t.p.i. For complete information on this device, write **Lyle B. Weber**, 2429 W. Vernon Ave., Los Angeles 8, Calif.



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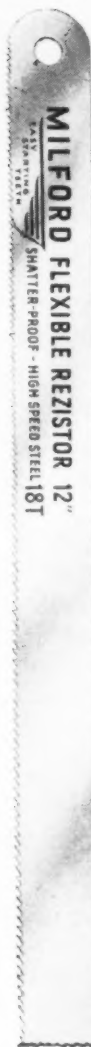
Try Star's new metal marking crayons. Ideal for use on hot, cold, damp or grimy metal. Withstand pickling, yet do not affect enamel application.

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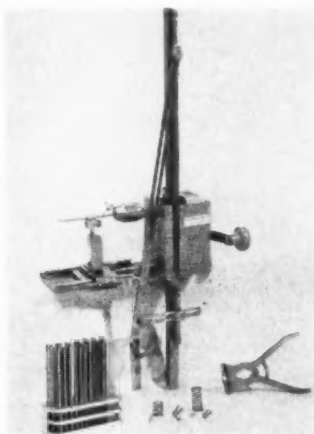


Resistor & Duplex
Hack Saw Blades

SOLD THROUGH SELECT INDUSTRIAL DISTRIBUTORS

SEMI-AUTOMATIC SPRING-COILING MACHINE

A semi-automatic machine for winding both left-hand and right-hand compression, extension and torsion springs is being marketed by The Carlson Company. The machine is especially useful for coiling small quantities of springs (up to about 100), and for making samples. The set-up time is only a few minutes and an operator can usually complete between 25 to 35 small-lot orders per day. Springs may be wound from spring steel, music wire, stainless steel, phosphor bronze or any other spring material.



The unit comes equipped with an arbor rack, containing 29 arbors made from ground, polished and hardened drill rods in sizes from 1/16" to 1/2" diameters advancing by 64ths. Three coiling points made from hardened tool steel and a wire cutter are also included.

The Carlson Spring-Coiler No. 1 will handle wire diameters up to 0.063" and will coil springs up to 3/4" diameter; however, larger outside diameters are obtainable with special arbors. Springs up to 4" in over-all length and up to 25 coils can be produced; pitches are adjustable from zero up to a wide range. The end coils of compression springs are closed or squared automatically, and the springs are wound with a uniform pitch and to an exact length. Extended lengths for forming special ends or hooks can be made. The machine is hand-operated but a motorized unit can be added if desired.

One turn of the handle produces three coils. Left-hand springs are made on the

inner shaft, and right-hand springs are made on the outer shaft. The lower bar is adjustable horizontally to determine length. The long cam is adjustable at various angles to determine pitch. The short cam and distance from roller to long cam are adjustable to make any number of closed coils from one-half coil to three. The position and movement of the rack is adjustable to determine the number of coils.

The machine is precision made of the best quality cold rolled steel for base-plates, gear box, and supports. Hardened tool-steel guides are used for slides and coiling points. All shafts revolve in bronze bushings. The machine is enameled in a machinery gray finish. Each machine is assembled, inspected and tested before shipment. For complete specifications, write **The Carlson Company**, Dept. BB, 277 Broadway, New York 7, New York.

Coal-burning steam locomotives in 1949 handled about 50 per cent of the freight traffic, measured in gross ton-miles, of the Class I railroads, compared with nearly 70 per cent in 1946 while that handled by diesel locomotives increased from less than ten per cent in 1946 to about 34 per cent in 1949.

STANLEY 1/4" ELECTRIC DRILL

Stanley Electric Tools announces a new, small size 1/4" Electric Drill which is light-weight, compact, durable and has ample power for drilling in metal, wood and composition materials.

Some of the drill's features include a strong aluminum die cast housing, three-jaw Jacobs hex key chuck, trigger type switch with locking device, helical, alloy steel, heat treated gears — sturdy and durable.



The capacity of the No. 14 Drills is 1/4" in steel, 1/2" in wood. The Drill is available in 115, 125, and 150 volts, 1100 r.p.m. (no load), net weight 3 lbs., overall length 8 1/4". For complete information write **Stanley Electric Tools**, 512 Myrtle St., New Britain, Conn.

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NOW YOU MAY SOLVE YOUR LAPPING AND POLISHING PROBLEMS

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One of the outstanding abrasive accomplishments of the war. Exclusive crushing and laboratory grading methods make STAR DUST the most accurately graded abrasive ever produced. Available in all grit sizes and as fine as .0001", far beyond the smallest "mesh" heretofore produced by conventional processes. Must not be confused with so-called "diamond dust".

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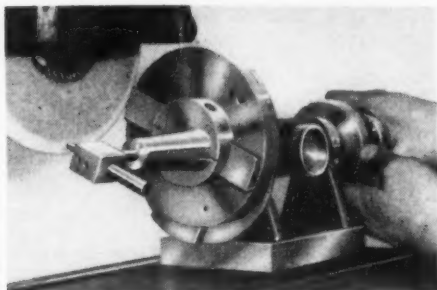
Pictured: a 38-Spindle Heavy-Duty Drill Head.

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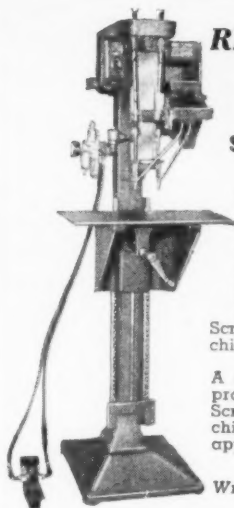
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Screw Driving Machines

Speed up production and reduce costs by driving from 2 to 6 screws at a time with Reynolds Multiple Spindle Screw Driving Machines.

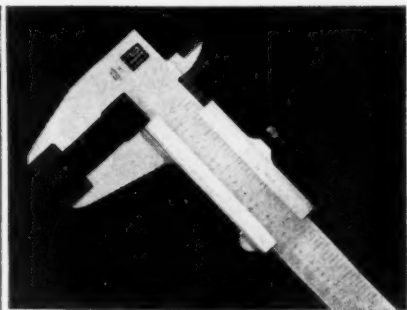
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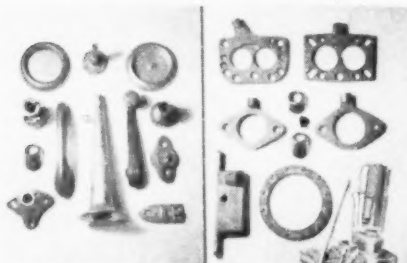
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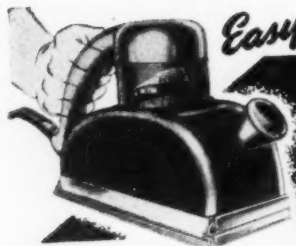


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**NEW MOLYBDENUM INDUSTRIAL
LUBRICANT**

An important development in the science of lubricating high-speed, high-temperature and high-pressure bearings, pioneered by large industrial concerns and others, has been the use of molybdenum in place of, or supplementing regular lubricating oils and greases. Molybdenum is an extremely "greasy" metal, practically indestructible at high temperatures and pressures, certain forms of it having the peculiar faculty of "plating" itself firmly to any friction sur-

face. This forms a permanent friction-supporting film which cannot be "squeezed out" by any amount of pressure, thus protecting the bearing against scoring or seizing even after all the oil has been burned out.

Molybdenum lubrication has now been made available in a form suitable for use in any conventional lubricating system, by a new development of the Lubricants Division of The Lockrey Company, which is now placing on the market a new molybdenum-base lubricant called "Liqui-Moly". This can be used alone, or added directly to crank-case or other oils which carry it to the friction-surfaces, where it "plates out" on the metal, providing a permanent low-friction anti-seizing coating. Actual tests have shown that friction-surfaces running at high speed and under heavy pressure will heat up from 300% to 504% faster with ordinary

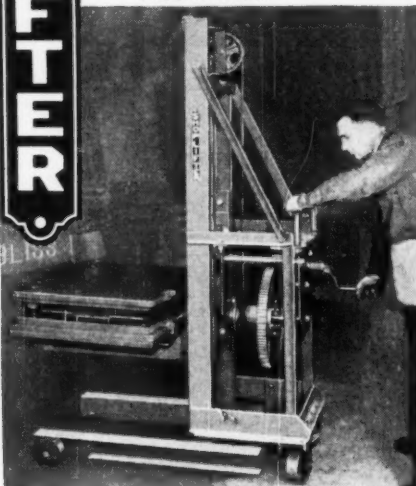
lubricating oil than when running dry with only "Liqui-Moly", and moreover that the temperature-rise with oil is continuous until failure and seizure, whereas with "Liqui-Moly" it reaches a stabilization-point and then usually recedes.

The material displays high chemical stability, and is unchanged in its properties by extremes of temperature, operating effectively either at sub-zero or red-heat. Typical applications aside from conventional use in automotive and other bearing and gear applications, are its use to lubricate deep-drawing dies, where

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... let an Economy SHOP-LIFTER do the heavy work around here.



Every shop needs a SHOP-LIFTER. Saves men, saves materials. Besides handling heavy dies, the SHOP-LIFTER can stack drums and boxes, unload street trucks, pick up skids and be used as an adjustable height table.

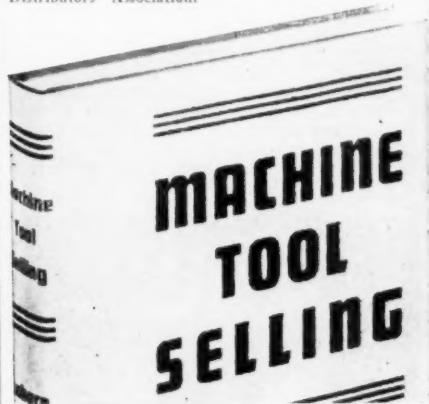
All steel, arc welded frame. Easily operated hoist unit with automatic brake, safely holds load at any height.

- 500 pound capacity**
- Type D, hand operated.....\$157.50
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- 1000 pound capacity**
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- 2000 pound capacity**
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- Floor lock to hold machine steady:
- \$10.00 extra for 500 pound sizes;
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Here's successful machine tool selling, distilled from the experience of dozens of top-flight machine tool salesmen and users of industrial production equipment. All the hard-hitting selling methods compiled in this manual came out of a comprehensive sales course sponsored by the National Machine Tool Builders' Association and the American Machine Tool Distributors' Association.



By **Harry J. Loberg**
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 203 pages, 6 x 9, \$3.50

This book brings you machine tool selling based on the actual dollar return to your prospect on his investment in your product. It explains how to show the ways your equipment can save him money and step up his output—without guesswork on your part. Covers assessing territory for potential business, following industrial changes in your market, buying motives of large and small manufacturers, planning sales talks, handling group interviews with maximum results, etc.

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it will even eliminate the hand-working of high-spots and prevent metal pull-out, the elimination of "run-in" time on precision-fit bearings and slides; as a pipe-fitting compound, where it insures a quick dis-assembly regardless of age, heat or corrosion; reducing friction and freezing in press-fitting, etc.

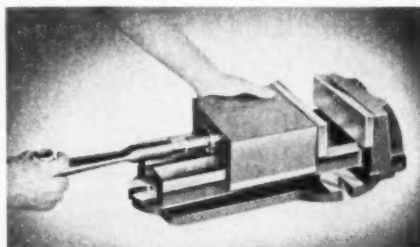
"Liqui-Moly" is made by **The Lockrey Company**, 21-02 122nd St., College Point 1, New York.

AMES PRECISION MACHINE VISE

A new machine vise, stated to be distinctly unlike other makes, has recently been added to the line of precision machine tools manufactured by Ames Precision Machine Works. The new Model 8 is designed for use on milling machines, drill presses and shapers. It is provided with jaws 8" wide that open to full 11" capacity instantly and tighten with tremendous gripping pressure with a fractional turn of the wrench. The new model is a strong, precision built unit, built for long service. For production work, it is

claimed that the Model 8 vise is quicker in set-up and action than any vise on the market.

The jaws and rails for the sliding block of the vise are hardened and accurately ground. The body of the vise weighs 85 lbs.; the sliding block weighs 40 lbs. The two parts come apart quickly, thus one



man can move and set-up alone. The vise's overall length is 21"; overall height is 5½". For complete data write **Ames Precision Machine Works**, 131 Lexington St., Waltham 54, Mass.

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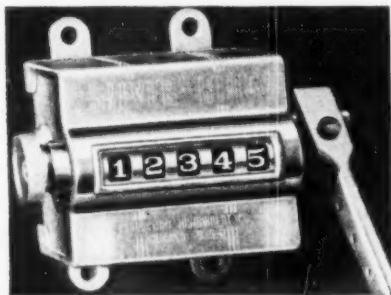
STURDIMATIC

TOOL COMPANY

TAMPER-PROOF STROKE COUNTER

Effective protection against tampering is one of the features provided in Silver King Counters announced by the Production Instrument Company.

Silver King mechanical counters are heavy duty stroke counters recommended for industrial applications, such as punch and drill presses, milling machines, and other production equipment.



The design incorporates a steel base and cover with chromium finish, lightweight plastic number wheels for reduced inertia, and unbreakable windows of reinforced plastic.

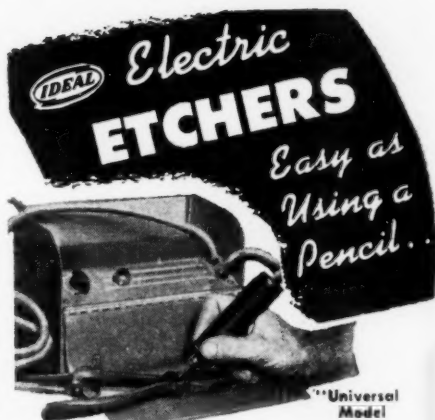
The new development, which is of particular advantage in automatic piece work counting, is a built-in device that prevents reverse operation of the reset mechanism. Any tampering with the reset knob is easily detected. In addition to the tamper-proof knob-reset model, the counters are available in key-reset and non-reset models. Further data is available from the manufacturer: **Production Instrument Co.**, 704-14 W. Jackson Blvd., Chicago 6, Ill.

RENEWING PROCESS FOR PHILLIPS SCREWDRIVERS AND BITS

The Zephyr Manufacturing Co. has announced a method of renewing Phillips type screwdrivers and screwdriver bits that have become worn or broken in service.

Screwdrivers renewed by this process conform to Phillips design and will equal new tools in service, according to Zephyr. Original hardness is not affected by the process, though length is slightly reduced. Most drivers can be repeatedly renewed.

Zephyr Manufacturing Co. is licensed under Phillips patents. Renewed drivers conform to original design and tolerances. For full details, write **Zephyr Manufacturing Co.**, 201 Hindry Ave., Inglewood, Calif.



Mark Iron, Steel or their Alloys

Burns a permanent mark right into the metal. Easiest, fastest way to mark part numbers and sizes—material description—owner's name on tools—identification of warehouse items—serial numbers, etc. Easily portable, nothing to get lost. Safe. "Universal" Model—four etching heats; 120, 240, 420 and 700 watts.

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The point turns with the work, permitting "hogging cuts" to be made at high speed . . . point will not burn off and cause tool to gouge work. Permanently accurate due to short overhang and unique bearing arrangement. Has special bearing seal. Sizes 1 to 5 morse taper. "Heavy Duty" model also available.



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CAPACITY:

$\frac{3}{8}$ " to $2\frac{1}{2}$ " drills.
5" x 9" adjustable table.

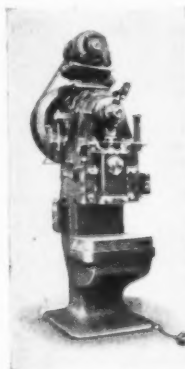
MOTOR: $\frac{1}{2}$ hp,
3450 rpm.

NET WT: 250 lbs.

CRATED: 320 lbs.

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**80% to
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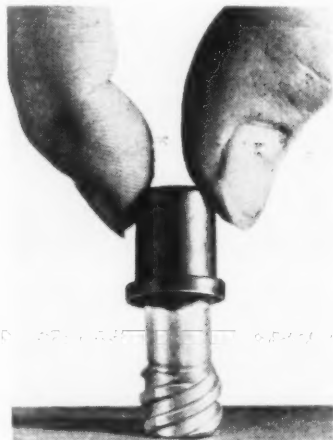
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PLASTIC CAPS FOR ALEMITE FITTINGS

S. S. White Elastoplastic Caps are designed to fit over $\frac{3}{8}$ " Alemite Dot Fittings to prevent dirt and other foreign substances from lodging on the tip. This protection is especially important for chemical, cement and foundry equipment and similar industrial machinery run under dirty or dusty operating conditions since abrasive matter can be forced into the fitting on the first lead-in shot of the grease gun and result in scored bearings.



Elastoplastic Caps are made of black, flexible vinylite. They are easily applied and removed, and hold by friction fit. They are not affected by oils, grease or gasoline. For full information, write S. S. White Dental Manufacturing Co., Plastics Division, 10 East 40th St., New York 16, N. Y.

GAS-POWERED HIGH-LIFT FORK TRUCK

A small gas-powered fork-lift truck designed for interplant handling and where outside work predominates has been introduced by Elwell-Parker Electric Co.

Equipped with a 17 h.p. air-cooled Wisconsin engine, electric generator and starter, the transmission and driving features are similar to that of an automobile. Lifting-lowering and tilting mechanisms are controlled by two levers on the cowl at the right of the steering wheel.

The truck's overall length including

30" fork is 102"; width 32½"; height with uprights telescoped 83½", extended 139". The maximum lift is 121". Total weight is 3900 lbs.

Travel speed with 2000-pound capacity load is 6½ miles an hour; lift speed of load 31 feet a minute; lowering, 35 feet a minute. Tilting angles of uprights, and speeds are: Forward 5° in 3 seconds; backward 10° in 5 seconds.

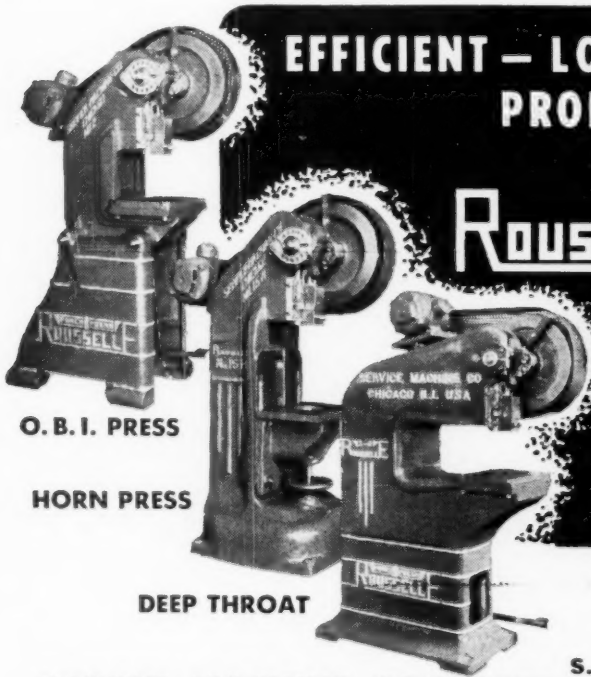
The truck's frame is of heavy-gage reinforced steel plates electrically welded into rigid tank structure. The engine is completely shrouded. Front-wheel drive axle is in three-point suspension in truck frame; steering is by means of rear caster type wheels. Clutch and brake are of automobile type and a ratchet lock on the brake pedal insures safe parking on inclines.

This truck is designed for long-run outside hauls but not to displace the all-electric for close range, repeated stop-and-go production operations. **Elwell-Parker Electric Co.**, 4000 St. Clair Ave., Cleveland 14, Ohio.

VERTICAL SLOT FORGE FURNACE

Protection up to 2400°F. against scaling during heating steel for forging or pressing, annealing or brazing ends or sections of bars, band heating, etc., is provided in the Lithium Atmosphere Vertical Slot Forge Furnace without the need for special prepared atmospheres. The slight coating of Lithium imparted to the work during these heating operations further prevents secondary oxidation to 2200°F. during the cooling down period in transferring work from furnace to forging hammer, press or upsetter, or while cooling after hot working.

Construction and operating principle of the furnace are simple. The Lithium Vaporizing Chamber, built integrally with the furnace, is a refractory lined steel shell, provided with gas burners or electric heaters. The chamber contains a tubular Lithium Vaporizer in which a cartridge of Lithium compound is vaporized by its own gas or electric heating



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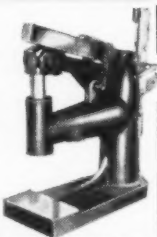
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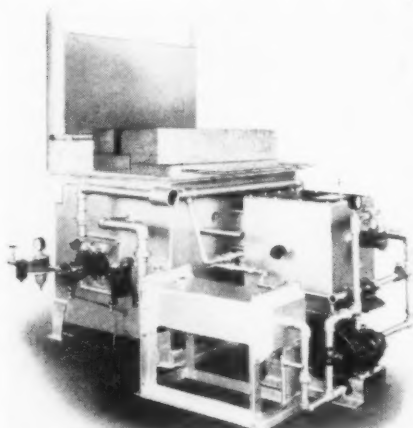
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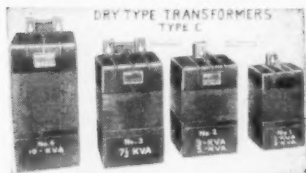
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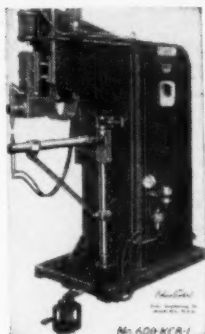
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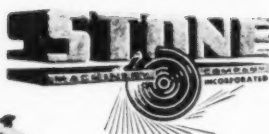
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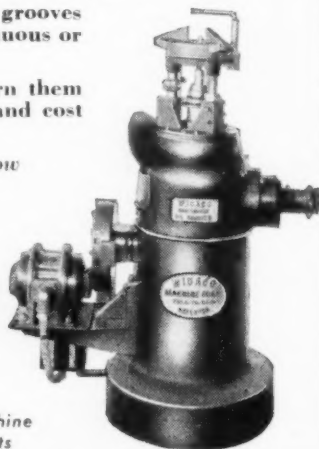
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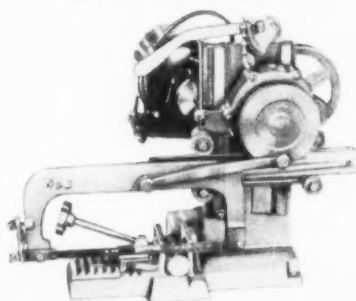
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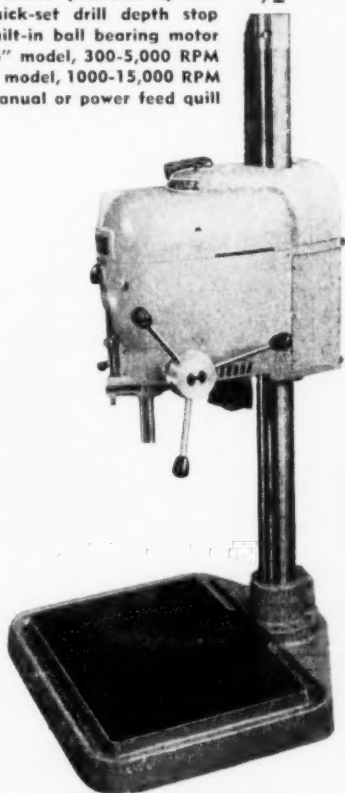
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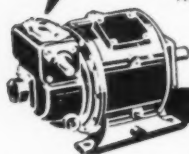
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William A. Munkacsy was elected president of Munray Products, Inc., sales division of The Poly-Cyclo Products Co., Cleveland, Ohio at a special recent board of directors meeting. Ray W. Grace was retained as vice-president in charge of sales and Ernest A. Munkacsy will continue as secretary.

G. R. Carrier, 1815 W. 95th St., Chicago, has been appointed exclusive representative for Hydro-Line Air and Hydraulic Cylinders and Special Machinery in the Chicago and northern Illinois territory.

Walter F. Munford has been elected vice-president in charge of operations of American Steel and Wire Co., Cleveland, by president Harvey B. Jordan. Munford succeeds Jordan who assumed the presidency of the Wire company, a United States Steel subsidiary, on January 1, 1950.

Leroy A. Critchfield has joined the Standard-Thomson Corporation, Dayton, Ohio, automotive and aviation parts manufacturer, as director of the company's chemical and metallurgical laboratory. John E. Golob, vice president and general manager announced.

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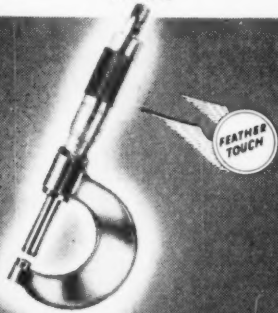
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Of the bearings taken from machinery, experience has shown that dirt is responsible for most failures—dirt that finds its way into the bearing, often due

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Ball bearings rolling in their raceways, which closely conform to the contour of the balls themselves, have a contact that often is under high pressure. Consequently, abrasive dirt (hard particles that cannot be washed or blown out), when mixed with lubricant, forms a lapping compound capable of destroying the fit-up and accuracy of the bearing.

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causing heat and skidding, and early bearing failure. Obstructive dirt can even cause breakage of the ball retainer, or it can cause the bearing to seize, if the raceways become smeared with metal chips. It can cause vibrations reflected in the finish and appearance of the machine's work.

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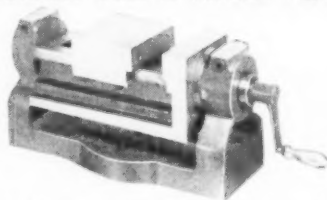
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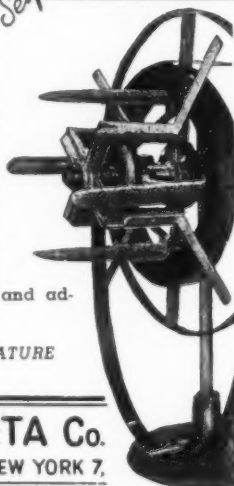
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LAPEER MFG. CO.

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SEAM WELDING ALUMINUM PROCEDURE

Seam-welding equipment for welding aluminum is similar to a.c. spot welding equipment except that the electrodes are replaced by roller electrodes from $\frac{3}{8}$ " to $\frac{5}{8}$ " thick and from 6" to 9" in diameter. One or both of these wheels are dressed to 158° to 166° included angle "V" or a 1" to 2" radius to concentrate the current in the weld. The wheels and the work are cooled by a flow of cool water of two to three gallons per minute directed against the periphery of the wheel near

the weld. Usually one of the wheels is driven at an adjustable constant speed from one to five feet per min. It is essential for seam welding that the welding timer initiate and cut off the current in synchronism with the supply voltage. Electronically controlled timing equipment is the only satisfactory means available for doing this with sufficient accuracy to produce uniform welds in aluminum.

Pressure-tight welds are made by producing a series of over-lapping spot welds. The current is cut on and off by the electronic timer, one weld being made for each "on" application of current. The speed of the rolls, together with the "on" plus "off" time, is adjusted so as to get the correct number of spots per inch, depending upon the thickness of one sheet. A number of combinations of cycles "on" and cycles "off" may be used, although the ratio of "on" time

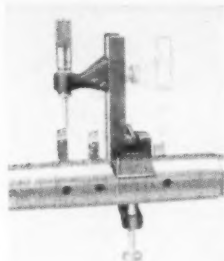
to "off" time should be from 1/5 to 1/3.

Welding pressure and current are adjusted to produce the desired surface condition and the proper weld width which should be about twice the thickness of the material welded plus 1/16". Poor surface condition may be improved by either increasing the welding pressure or decreasing the welding current. Excessive welding speed will result in the work sticking to the welding wheel.

(Material courtesy of Aluminum Company of America).

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GAGES



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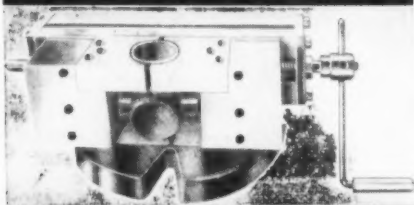
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?

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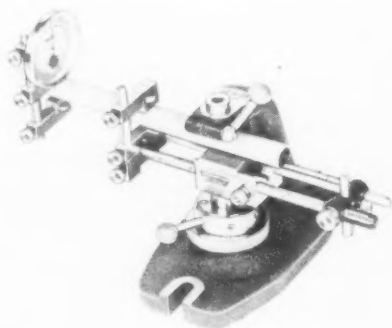
Write To

HEUSER MFG. CO.

1638 N. Paulina St. Chicago 22, Ill.

"REGLUS" UNIVERSAL DRILLING TOOL

A universal drilling tool called the "Reglus", manufactured in Switzerland and exclusively distributed in the U.S.A. and Canada through Cosa Corporation, simplifies exact drilling of round, flat, square or hexagonal workpieces within an accuracy of 0.0003". With accessories the device drills holes at predetermined intervals, adjacent holes for making slots, holes at any radial angle, and holes in balls. Automatically centering, the unit eliminates tracing-out and center punching.



Although primarily a drilling tool, the versatility of the "Reglus" offers many tools in one. It is an angle comparator in two planes. It serves as a depth gage and a center distance comparator on round, square, or hexagonal stock. It can drill angle holes in round balls. It is a miniature jig borer.

This "Reglus" tool, holding workpieces up to 1 1/4" dia., accommodates a series of cylindrical drill bushings having drill holes ranging up to and including 15/32" dia. Bushings, inserted from the top, are clamped by an upper ball-grip lever. The required distance between holes is set direct on one of two verniers on the standard vee-pieces or on the adjustable stop, depending upon distance of the holes from the top, collar, etc., or from the end, of the workpiece. Work is fixed upward in the instrument by rotating the knurled barrel nut at the base of the instrument. For repetition work, a ball-grip lever may be fitted to this setting nut.

Accessories include a vee mount for holding pieces from 3/32" to 11/32" dia.; a cone mount for drilling balls up to 1 3/8" dia.; and a modified mount for drilling flat and eccentric pieces. The accessory which permits the drilling of

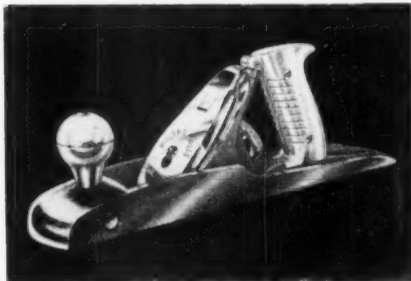
holes at any radial angle consists of a clamp attached to a dial having a gravity pointer. This unit clamps directly to the workpiece and is made so that it easily revolves around the workpiece to set the pointer at zero position to start. Further turning of the workpiece shows the required angle by a direct reading on this dial.

Use of the "Reglus" by engineers, machinists and others practically eliminates all tedious layout work ordinarily involved in designing specialized drill jigs and fixtures for accomplishing varied jobs. The tool is adapted also for use in research projects, and for engineering school laboratories. Complete information is available upon request to **Cosa Corporation**, 405 Lexington Ave., New York 17, N. Y.

NEW HAND PLANES

Two new hand planes, offering many new features, are being marketed by the Millers Falls Company. The cutting iron is one solid piece of high quality tool steel, precision heat treated to take and hold a keen honed edge. A patented three-point bearing locks the cutter iron to the frog and bed completely so that vibration and chatter are said to be eliminated. Clamping and unclamping can be done very easily.

Depth adjustment is accomplished by finger-tip control through a larger knurled adjusting nut and more powerful linkage. The glossy red knob and main handle are made of Tennessee Eastman Tenite No. 2. A rugged, aluminum alloy die casting provides a stronger, more

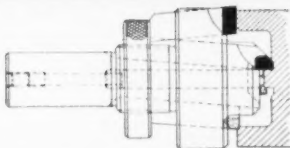


rigid support for the handle and entirely encloses both "iron" adjusting mechanisms. The bearing on the bed is longer than usual and is anchored to the bed by three screws to give greater strength and rigidity.

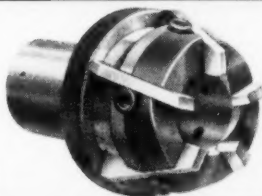
Complete information is available from **Millers Falls Co.**, P. O. Box 13, Greenfield, Mass.

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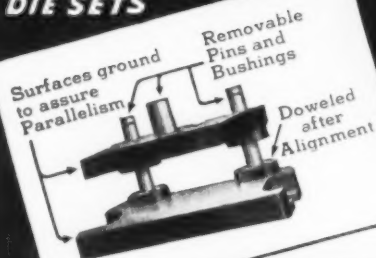
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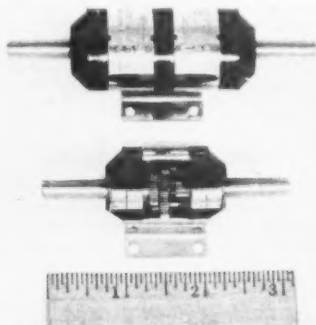
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METRON INTRODUCES MINIATURE SPEED CHANGERS

Precision hobbled gears of 96 pitch are now available in the Metron line of miniature speed changers. These high quality hardened gears are stated to provide smoother, quieter operation, better angular precision, and about one half the backlash that is obtainable with the 48 pitch extruded gears used in the standard units.



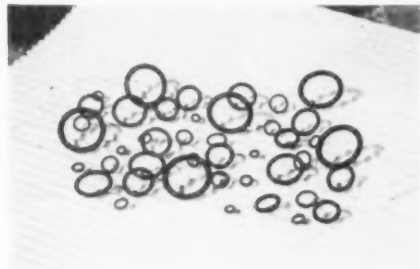
Available in single or multiple sections and with more than 500 different ratios, these tiny units are recommended for instruments, controls, computers, recorders, regulators, etc. where low-power quality gearing is required. Weight and dimensions are the same as the standard units. Tentatively rated at 1/50 horsepower, with speeds as high as 20,000 r.p.m. on the high speed shaft, and torques as high as 1½ pound-inches on the low speed shaft are practical. For complete data on these small units, write **Metron Instrument Co.**, Dept. BB, 432 Lincoln St., Denver 9, Colo.

INJECTION MOLDED O-RING SEALS

Closer dimensional tolerances, greater uniformity of production and lower cost are now possible in the manufacture of O-rings, by means of a new injection molding process, pioneered by Minnesota Rubber and Gasket Co. O-rings have come into extensive use since the war, primarily as shaft and piston seals on reciprocating machinery. Industrial designers have found that their ease of installation and simplicity of design have enabled machining and assembly costs to be reduced considerably over the old type of hydraulic seals.

The manufacturer has developed a new synthetic rubber compound specially de-

signed for O-ring use. This compound has special characteristics for high resistance to oil swelling and abrasion. Its high tensile strength makes it suitable for high hydraulic pressures.



Although O-rings are generally restricted to sealing oil pressures of 3000 p.s.i., the manufacturer has made installations in which O-rings have given excellent service at 10,000 p.s.i. The O-ring catalog contains complete engineering data including installation charts. It is available upon request from Minnesota Rubber & Gasket Co., 3630-H Wooddale Ave., Minneapolis 16, Minn.

LOOM MOTOR INTRODUCED BY LOUIS ALLIS

The Louis Allis Co. has announced the development of a new ball bearing Loom Motor.

The development of this new unit incorporates findings which were established in a series of tests that were performed to settle the controversy over the most satisfactory loom motor design. Emphasis was placed on bearing construction, mechanical stability, electrical performance, over-all loom efficiency and performance of the loom under actual mill operating conditions.

Field tests demonstrated that grease lubricated ball bearing motors of this new design would withstand the shock and vibration encountered in high speed weaving and, at the same time, would eliminate the necessity for frequent oiling of waste packed sleeve bearings which had formerly been used on loom motors. In addition, these tests indicated that the smoothest loom drive is obtained without the use of external flywheels, but with a special stator and rotor design which provides medium to high slip. By this means, power peaks are



No. 10



No. 11



No. 12



No. 13



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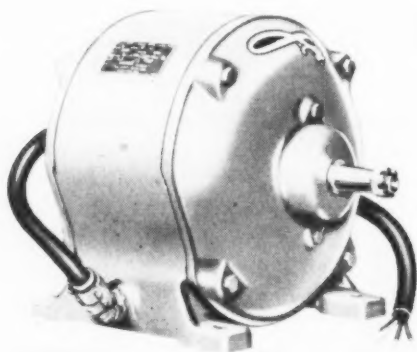
Best buys on the market are these all-steel Handnibs: No. 1 shears wide sheets up to $\frac{1}{8}$ " thick, cuts up to $\frac{1}{16}$ " round stock; No. 6—with 8" depth throat, punches holes from $\frac{1}{8}$ " to $\frac{1}{2}$ " through stock up to $\frac{1}{8}$ " thick. Ask your Dealer for a demonstration or write for illustrated catalog.

NATIONAL MACHINE TOOL CO.
DEPT. 100-C • RACINE, WISCONSIN



greatly reduced and regeneration is minimized or completely eliminated.

One of the new loom motor styles is shown in the picture of the 216 frame rated 1 h.p. at 1735 r.p.m. The "hour glass" construction shown permits these



motors to be used as replacements for the older style loom motors of less h.p. capacity, and for converting group driven looms to individual motor drives without

extensive modification. This rugged frame is also suitable for new high speed looms. Increased picking speeds are now made possible by the replacement of existing $\frac{1}{2}$ h.p. motors with this new 1 h.p. unit.

Outstanding features of these new loom motors include heavy duty, factory lubricated ball bearings, locked in place to provide ample end thrust capacity. Special rotor design permits the loom to utilize more fully the kinetic energy of the large diameter rotor. This design permits the motor to drive the loom throughout the entire picking cycle, thereby eliminating the losses and the heat which would result from regeneration. Cyclic peaks of power have been reduced to a minimum without the use of external flywheels. This leveling of the power input curve materially improves the power factor of the motor as well as the overall efficiency.

This new type of ball bearing loom motor is available in ratings of $\frac{3}{4}$ h.p. to 2 h.p. It is available in the 214 and 216 frames for use on old style looms and also in the NEMA 224Y and 225Y frames for installation on new looms of modern design. For complete information, write The Louis Allis Co., Milwaukee 7, Wis.

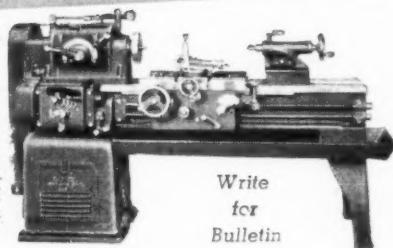
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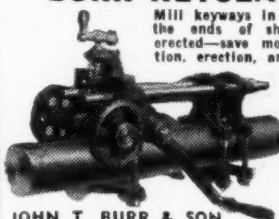
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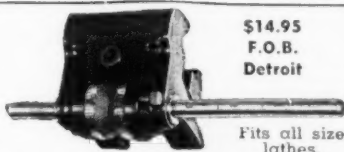
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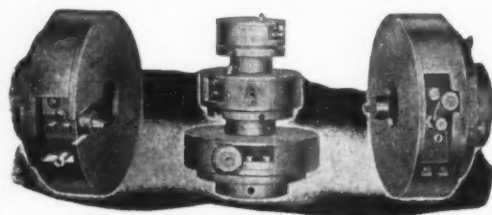


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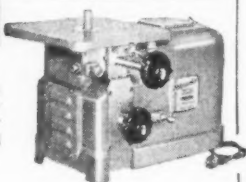
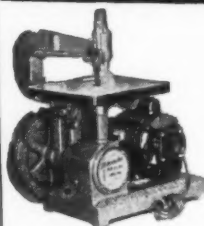
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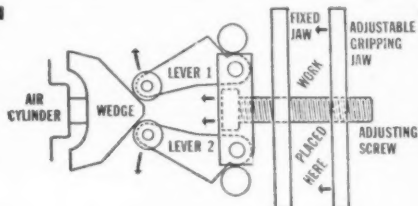
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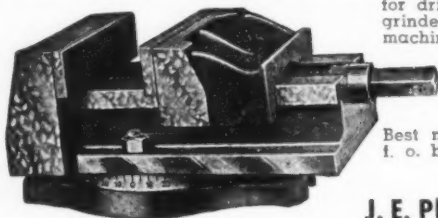
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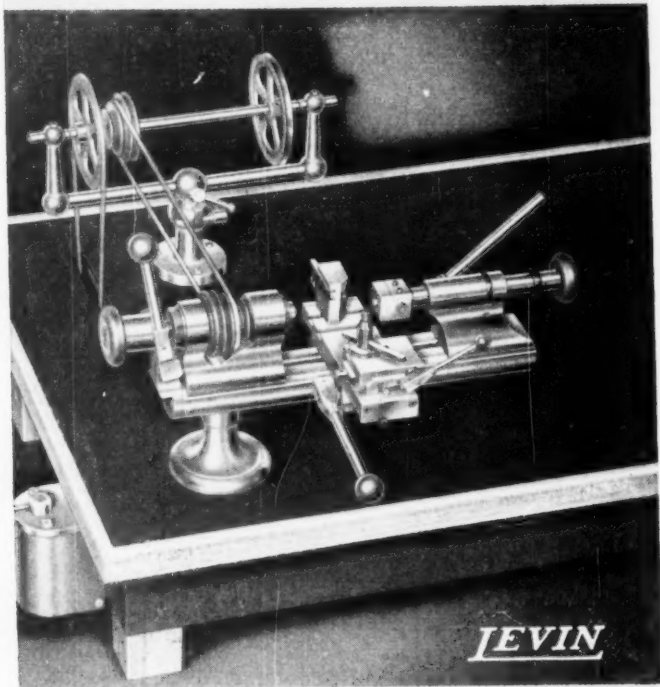
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QUALITY CONTROL INDICATOR

General Electric engineers recently introduced a new device which they say can be instrumental in assuring the highest quality of most mass-produced items, while reducing manufacturing costs.

The instrument, an electric computer which is called a "quality control indicator", was demonstrated publicly for the first time at a recent New York news conference. It keeps an automatic, continuous check on reject rates in manu-

facturing operations, and makes possible the location and remedy of abnormal production difficulties as quickly as they occur.

Developed by the G-E General Engineering and consulting Laboratory for the company's Appliance and Merchandise Department, the quality control indicator is in operation on the G-E refrigerator assembly lines at Erie, Pa.

"The indicator is a very valuable tool which helps our workmen to produce more perfect parts," said L. H. Miller, manager of the G-E Household Refrigerator Division. "It tells them, at the earliest possible moment, when a new trouble exists. The use of QCI gives us a firm hold on quality, high efficiency in controlling new troubles, and reduced manufacturing losses."

Statistical analysis of production and rejection rates in the past has been made by time-consuming computations, lagging behind production by

hours or days. During such a lag, it is possible for a high rejection rate to go undetected, it is said.

Essentially an electric calculating machine, it counts the number of items produced and the number rejected, and indicates on a meter whether the percentage of rejections is above or below an acceptable level at any given instant.

The indicator is being marketed by General Electric Company's Special Products Division, Schenectady 5, N. Y.



CUTTING COSTS? TRY CRALEY TWO-LIP BORING TOOLS

Two cutting lips instead of one.
Half the number of trips to the
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Less down time due to dull cutting
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Sharpened the same as single lip tool.
Grind only on top of cutting edge,
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Greater diametrical clearance, freer
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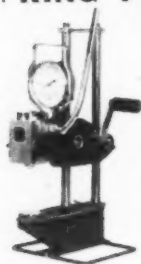
Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS

Simply insert in holes, invert, strike sharply and
you have centers and drill
circles perfectly located.
Reduce time and eliminate
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8 sizes, from $\frac{1}{8}$ " to $\frac{3}{4}$ "
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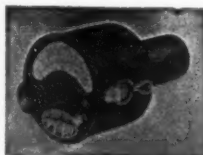
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Temperature is re-
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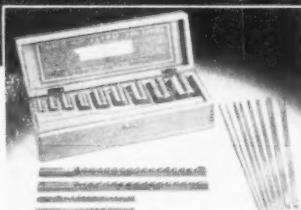
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A
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YES SIR! With a du Mont *Minute Man* Keyway Broach and Bushing costing only \$8.25, you can cut 100 keyways in gears, cutters, hubs, collars, couplings — 8¼¢ each, 99¢ a dozen!



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SILVER BRAZING PREFORMS COSTS CUT BY NEW METHOD

A 30 to 52% reduction in the cost of silver brazing preforms is offered users because of a new method of coining silver alloy washers for various fusing, bonding, brazing, and soldering operations. Developed by the Lucas-Milhaupt Engineering Company, the process forms a washer by subjecting round wire rings to 180,000 pounds pressure p.s.i. between polished dies. These above savings are

said to be possible because the novel method eliminates the need of expensive dies as well as the excessive scrap associated with conventional stamping methods. Only as much of the silver alloy is used as is actually necessary to form the washer.

Available in Easy-Flo and Sil-Fos, washers can be produced in a variety of shapes and sizes, according to individual specifications. Economically coined washers are especially suitable for silver brazing, soldering or joining of metals requiring costly silver alloys. First cost savings, along with improved, faster handling and elimination of waste, lower the finished product cost and are reflected in greater profits and increased buyer good will.

Because flat rings fuse into metals more readily, forming a more perfect bond and seal, they are replacing wire rings formerly used in joining fittings for drain plugs on crank case pans, differential housings and fluid drive seals. They are also widely adaptable for bonding and joining applications in the refrigeration, heating and air conditioning, food processing, and other equipment manufacturing industries where extra strong joints or air-tight seals are essential.

Estimates, recommendations and samples will be supplied for all inquiries submitted to the company without charge. Write **Lucas-Milhaupt Engineering Co.**, Dept. BB, 5057 So. Lake Drive, Cudahy, Wis.

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FORD DEVELOPS ENGINE BLOCK CLEANING PROCESS

Through the application of a special process for the internal cleaning of engine blocks, Ford Motor Company has practically ruled out the possibility of engine trouble developing due to inadequate block cleaning, according to Logan Miller, general manager of the Rouge Division.

The process employs a new shot blast cleaning machine that is said to

be the first of its kind in the automotive industry. It guarantees additional protection against core sand remaining in the internal cylinder block water passages.

The new pressure blast machine supplements conventional equipment now in use to remove burnt core and molding sand and scale from interior and exterior surfaces of the motor block casting.

Ford ultimately plans to equip each of the production foundry's motor block cleaning systems with the new compressed air blast cabinets.

The installation provides the latest known means of insuring removal of core sand and foreign material left inside the block following casting. Possibility of obstructions developing in water circulation, thereby creating faulty or broken cylinder blocks in cars during operation is minimized.

The new blasting technique works as follows: motor blocks to be blasted are brought by conveyor one at a time into the blast cabinet. Two work positioning arms, one for each side of the casting, register the block in correct position for applying the blast of shot. The blast is blown through sixteen nozzles under air pressure of 85 pounds per square inch.

The air-driven shot strikes hidden sand or scale, freeing it from the metal's surface. The loosened material then can be removed from the block's interior.

MAGNETIC SWEEPER USEFUL INDUSTRIAL PLANT FLOOR CLEANER

A magnetic sweeper that is run along shop floors to pick up stray nuts, bolts, screws and small metal parts has been



introduced by Ullman Products Corporation.

The Magimmick Magnetic Sweeper consists of a 12" powerfully magnetized

sweeping surface. It rolls easily over floors on fibre wheels, picking up all small steel parts. Compactly designed to get into narrow spots, the Magimmick Sweeper reaches into corners, under benches and machines. The special patented release feature enables the operator to release sweepings merely by opening the cover. This breaks the magnetic adhesion and articles drop off instantly. The Magimmick Sweeper is a permanent magnet.

For further information, write the manufacturer, **Ullman Products Corp.**, 152 Prospect Ave., Brooklyn 15, N. Y.

MAGNETIC CATCH FOR CUPBOARD DOORS

A new product which should be of interest and use in all types of industrial plants, as well as in offices and homes, is the Leco-Latch, recently introduced by Laboratory Equipment Corporation, manufacturers of precision control equipment. The Leco-Latch is a magnetic latch for use on cupboard doors. The device's principal benefit is in keeping warped and sagging doors closed. The magnet used is permanent, and is said to last a lifetime.

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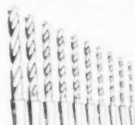
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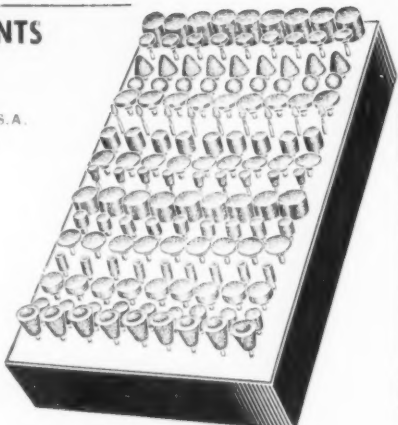
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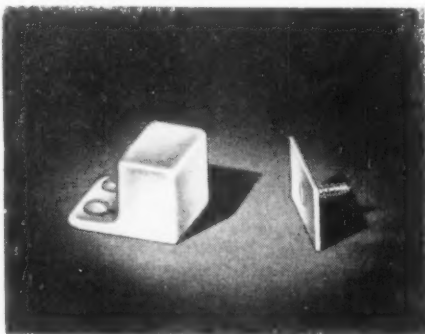


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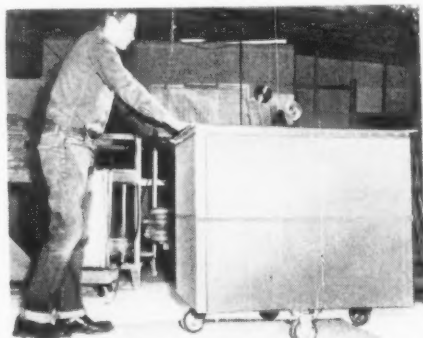
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The frame of the Tobey truck is manufactured from high tensile strength aluminum alloy angles. Panels are aluminum alloy sheet flush riveted so that all inside surfaces are smooth. This all-aluminum construction makes these trucks non-magnetic and non-sparking. Moreover, they require no paint and will not rust, splinter or absorb odors. Because the weight is so light, a heavier payload can be carried in a Tobey truck with less strain on the worker.

For special applications, such as the food industry, these trucks have an advantage in that they can be washed down and steam cleaned.

In handling inflammable material, the non-sparking quality of a Tobey truck is an important safety feature; and in the dyeing and printing industries, where the truck is apt to come into contact with acids, it will not corrode or deteriorate.

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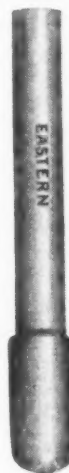
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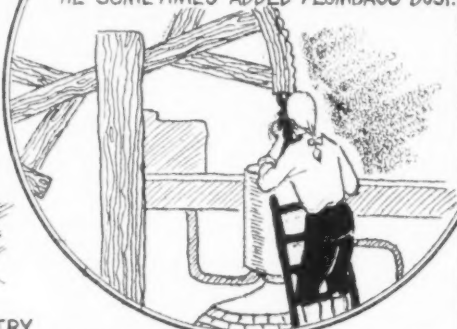
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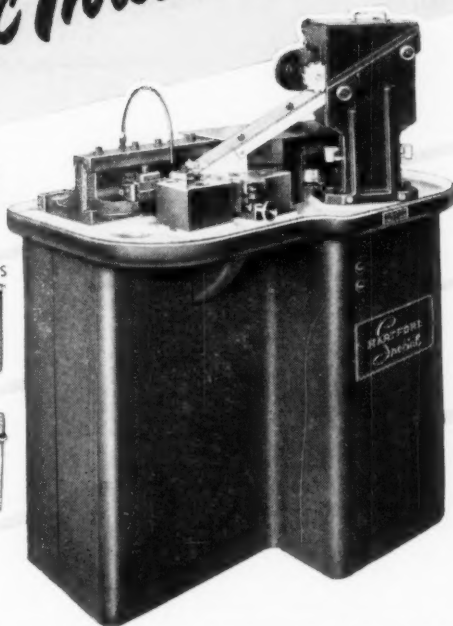
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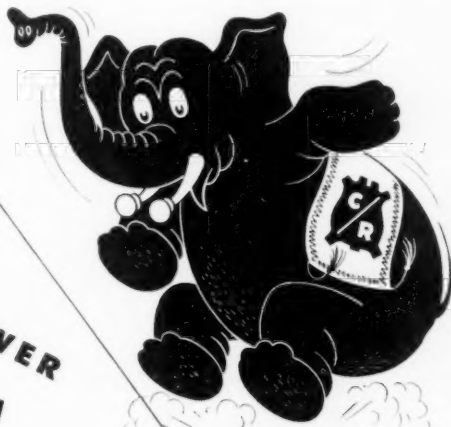
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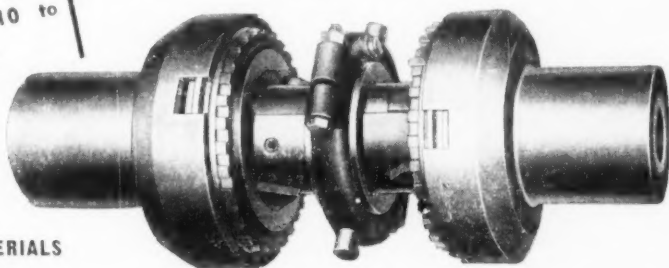


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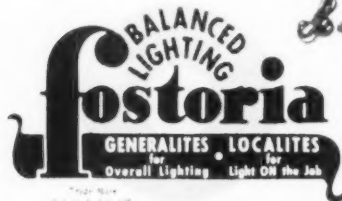
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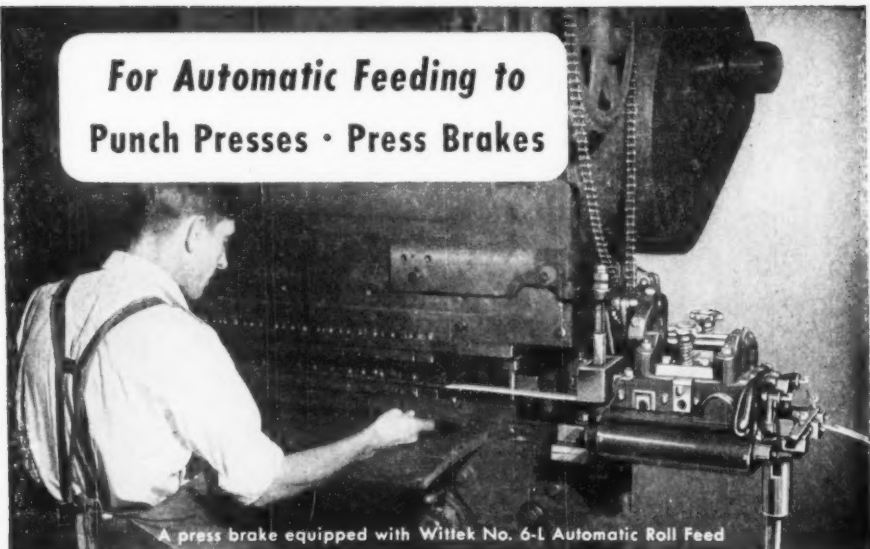
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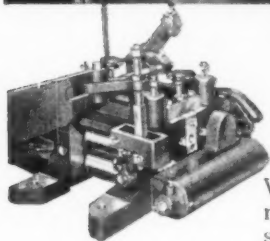
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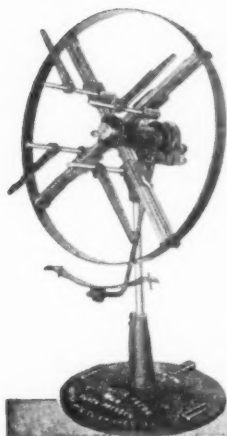
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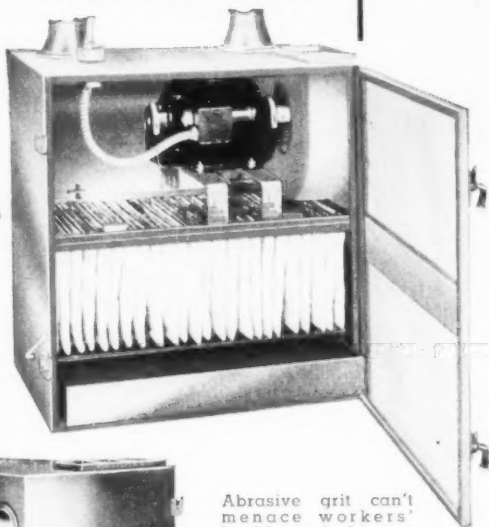
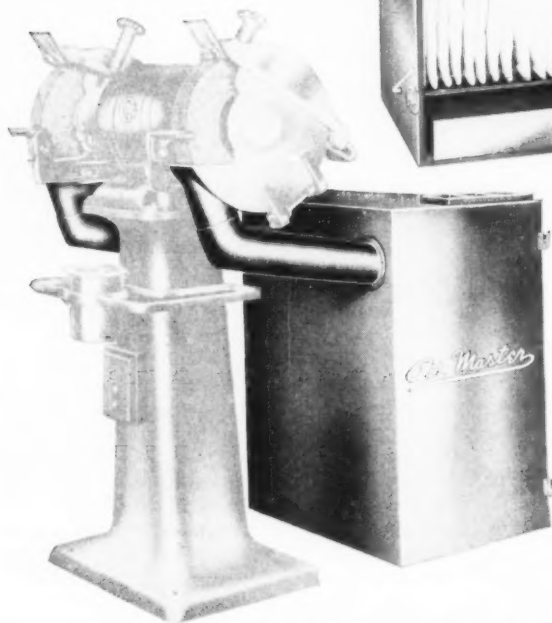


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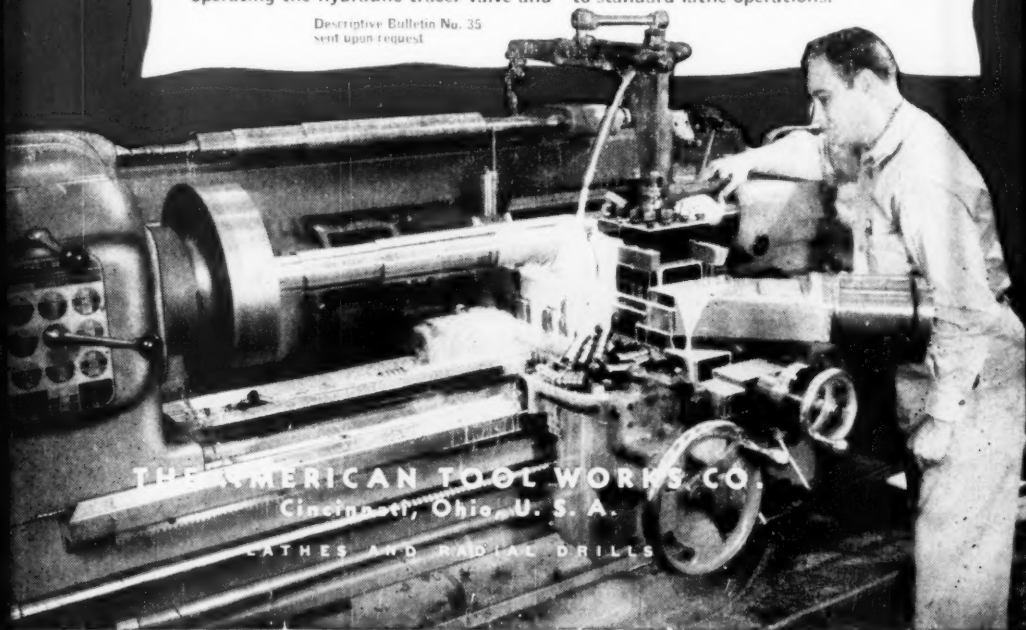
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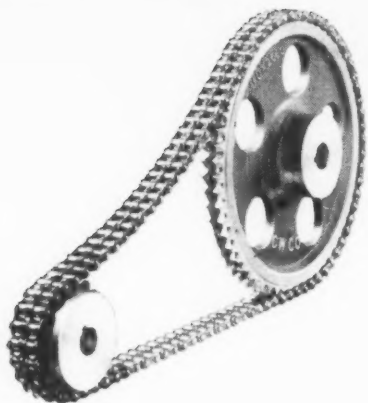
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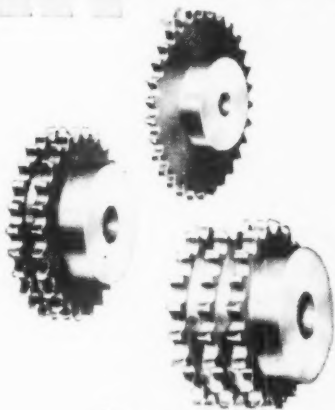


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